PLANNING AND IMPLEMENTING SUSTAINABLE AGROFORESTRY PROJECTS WITH LOCAL PARTICIPATION: LESSONS LEARNED FROM THE HAITI AGROFORESTRY OUTREACH PROJECT

A Project Report

Presented to the Faculty of the Graduate School

of Cornell University

in Partial Fulfillment for the Degree of

Master of Professional Studies (International Agriculture)

by

Silvana P. Comino

May 1988

Members of Special Committee: James P. Lassoie

Norman T. Uphoff

ABSTRACT

The majority of past mitigation projects have been inadequate to meet the challenge of reforestation in Haiti. However, one tree planting project, the Agroforestry Outreach Project (AOP) appears to be successful in mobilizing small farmers to plant trees for profit. This Project is often cited as one of the few large-scale agroforestry projects worldwide which has been (and still is being) implemented successfully. The author analyzes the design and implementation features leading to this "success." Using her own criteria of success which includes the concepts of farmers participation and project continuity after external funding stops, she concludes that the AOP is not a complete, but a partial multidimensional success.

The last section highlights the lessons learned in the Project which may assist the Government of Haiti or other national and international organizations to plan and implement sustainable agroforestry projects which offer small farmers a real chance to participate in the solution of Haiti's environmental and development related problems.

BIOGRAPHICAL SKETCH

Silvana Comino was born in Basel, Switzerland in 1962 and educated in Switzerland, Peru and the United States. In 1985, she obtained a B.S. Hons degree in Conservation and Resource Studies from the University of California, Berkeley, with a focus on Ecological Rural Development.

Her commitment to assist the developing countries' struggle for self-determination began when she was a young teenager. Extensive traveling in Latin America, and study and research in Peru and the Amazon region of Brazil provided her with first-hand exposure to malnutrition, alarming degradation of agro- and forest ecosystems and conditions faced by those living on the edge of subsistence.

Her experience includes: employment with the Inter-american Development Bank (Summer 1987), various internships with private voluntary organizations engaged in environmental protection and development activities for marginal groups, extensive visits of agricultural rural development projects in Mexico and Brazil, and completion of a tropical agricultural course in Costa Rica.

In 1986, she registered at Cornell University and completed the requirements for the degree of Master of Professional Studies in International Agriculture in 1988.

To all exploited and powerless people to whom I have a life-long commitment to assist them in their struggle to liberate themselves from the chains of oppression and to achieve more fulfilling lives.

ACKNOWLEDGEMENTS

I would like to express my gratitude and appreciation to Professor James P. Lassoie for supervising this study and for his valuable assistance as a Chairman of my Special Committee. He is one of the few Professors I met who practices the concept of participatory education. He believes Professors can learn from students and respects the students ideas. In many of the Agroforestry Seminars, we have learned from each other and encouraged and stimulated each others thinking processes.

Many thanks also to my second member of the Committee, Professor N. Uphoff who read my thesis with a sharp editorial eye. In addition, I would like to thank Kristy Cook for her editorial help, her moral support and for being a special friend. Finally, my compañero and amorcito Keith Anderson deserves special recognition for his artistic contribution reflected in several figures of this study and his colorful loving spirit which brighten up the long hours in the dark computer room.

PREFACE

Many interesting agroforestry and rural development experiments are being undertaken currently. Many of them are undocumented and the lessons learned remain in the dark. A lot has been written about the Agroforestry Outreach Project (AOP) in Haiti. But the documents are not easily accessible to the public and special effort and contacts are needed to obtain USAID and private voluntary organizations' unpublished documents and reports. This study taps this "gray literature" and I hope that the descriptive and analytical information provided on the AOP endows future project planners and implementers with concrete insights into the most promising routes to follow in future agroforestry projects.

The findings of this study are limited since I did not have the opportunity to conduct field research in Haiti. The main limitation is that the opinions of the farmers most closely involved with the Project are not incorporated in this study. Fortunately, I had the opportunity to interview several persons who are familiar with the Project. They have helped me to gain a more personal view on the strengths and weaknesses of the Project. I owe special thanks to Mike Benge (USAID), John Lewis (USDA), Toby Pierce (former advisor to the Government of Haiti), Phoebe Landsdale (PADF), Charles Tapp (CARE) and M.R. Pierre-Louis (former Haitian government official).

I gathered the materials for the preparation of this

study by visiting the headquarters of USAID and the two implementation agencies, Pan American Development Foundation and Cooperative American Relief Everywhere, in Washington D.C. and New York, respectively. They kindly opened their files to share the information of many of their unpublished reports with me. I greatly appreciate their kindness.

This report is structured as follows: Chapter I gives a summary of Haiti's current dire situation and outlines the major factors leading to the ongoing deforestation. The author then explains why she chose to analyze one particular agroforestry project. Chapter II uncovers the conceptual cornerstones of the Project by looking at past forestation activities. Chapter III briefly describes the overall framework of the Project and its preliminary results. Chapter IV outlines the major feature of the new approach which is characterized as a hybrid between the conventional blueprint and newer learning process approach. It then contrasts the different implementation approaches adopted by the two implementing agencies, CARE and PADF, together with their major accomplishments and problems. Chapter V and VI lay out a conceptual framework of the main elements to achieve full participation and sustainability and contrasts it with the actual Project results achieved so far. The final chapter deals with certain key aspects which might lead towards a more self-sustaining agroforestry development path with its principal ingredient of local participation which can open many new doors for the previously unreached and neglected poorest of the poor.

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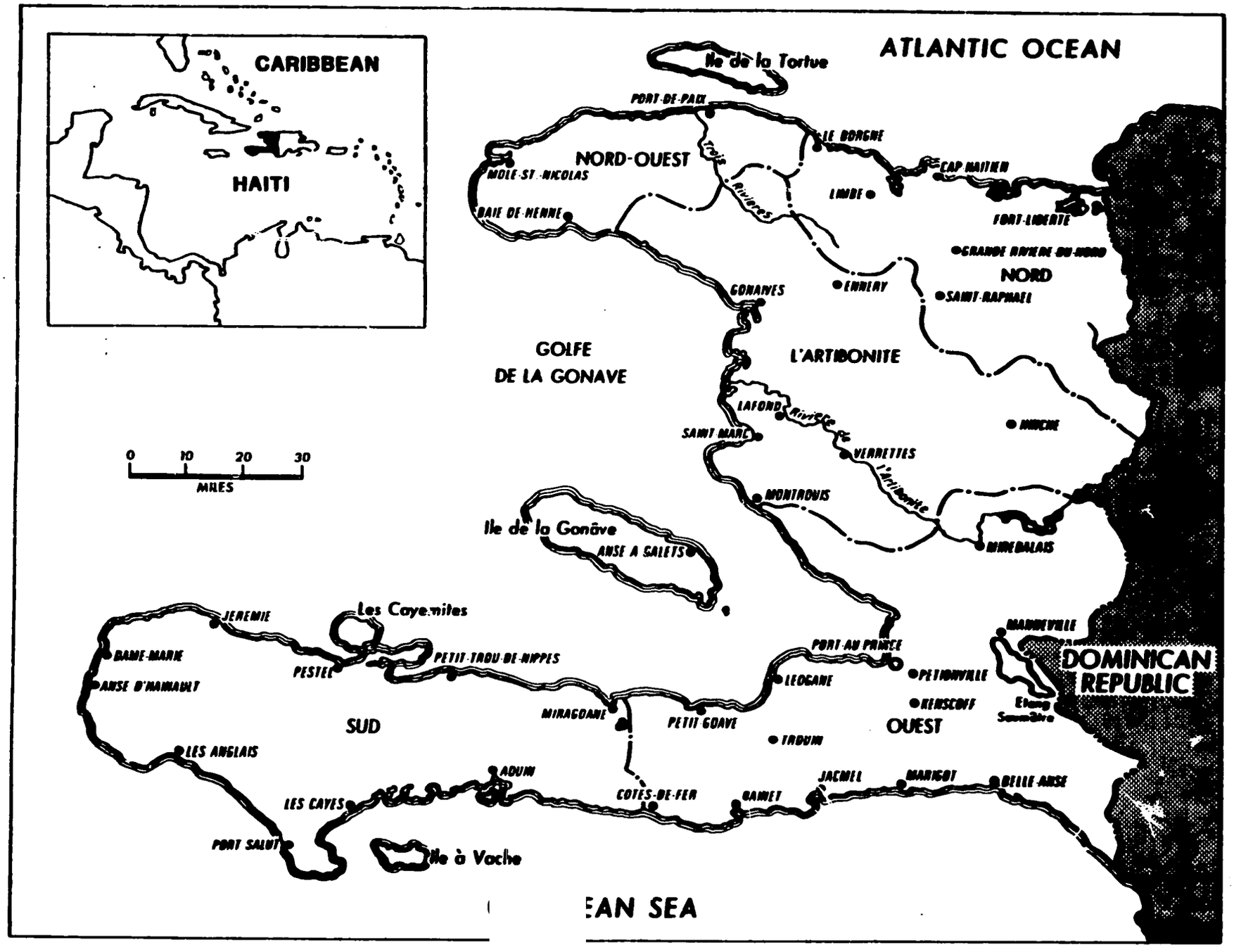
LIST OF ACRONYMS AND ABBREVIATIONS

ARC	Agroforestry Resource Center (PADF)
AOP	Agroforestry Outreach Project
BPA	Blueprint Approach
CAFTCEN	CARE-Agroforestry Outreach Project Training Center Network
CARE	Cooperative for American Relief Everywhere
CIDA	Canadian Agency for International Development
DRN	Natural Resources Division within the Ministry of Agriculture, Natural Resources and Rural Development (Direction des Ressources Naturelles)
DATPE	Land-Use Planning and Environmental Protection Division within Ministry of Planning (Direction d'Amenagement du Territoire et Protection de l'Environment (Ministry of Plan)
FAO	Food and Agricultural Organization of the United Nations
GOH	Government of Haiti
GTZ	German Technical Cooperation
HACHO	Haitian American Community Help Organization
IDB	Interamerican Development Bank
LPA	Learning Process Approach
MARNDR	Ministry of Agriculture, Natural Resources and Rural Development (Ministere de l'Agriculture, des Resources Naturelles, et du Development Rural)
NGO	Non-Governmental Organization
ODH	Operation Double Harvest
ODNO	Development Organization for the Northwest (Organisme de Development du Nord-Ouest)
ONAAC	National Organization for Literacy and Community Action (Organisation National de alphabetisacion et accion communitaire)
PADF	Pan American Development Foundation
PDAI	Integrated Agricultural Development Project (Projet de Developpement Agricole Integre (USAID))
PLAN	Ministry of Planning (Ministere du Plan)
PVO	Private Voluntary Organization
TPTC	Ministry of Transportation and Public Works
UMO	University of Maine-Orono
UNDP	United Nations Development Programme
USAID	United States Agency of International Development
USDA	United States Department of Agriculture
WFP	World Food Program

OTHER TERMS

PROJE PYEBWA	Haitian Creole for "the Tree Project"; PADF used this term to refer to the AOP
TONTONS MAKOUTES	Civilian Militia formed under President Duvalier


CARIBBEAN
HAITI
ATLANTIC OCEAN
Ile de la Tortue
PORT-DE-PAIX
LE BORGNE
CAP HAITIEN
NORD-OUEST
MOLE-ST-NICOLAS
Trois Rivières
LIMBE
BAIE DE HENNE
FORT-LIBERTE
GRANDE RIVIERE DU NORD
NORD
GONAIVES
ENNERY
SAINT-RAPHAEL
GOLFE
DE LA GONAVE
L'ARTIBONITE
LAFOND
Rivière de
l'Artibonite
HINCHE
SAINT MARC
VERRETTES
0 10 20 30
MILES
MONTROUIS
Ile de la Gonâve
ANSE A GALETS
MIREBALAIS
Les Cayemites
JEREMIE
PORT-AU PRINCE
MANNEVILLE
BAIE-MARIE
PESTEL
PETIT-TROU-DE-NIPPES
DOMINICAN
REPUBLIC
ANSE D'HAINAULT
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KENSCOFF
Etang
Saumâtre
SUD
MIRAGOANE
PETIT GOAVE
OUEST
TROUIN
LES ANGLAIS
AQUIN
JACMEL
MARIGOT
BELLE ANSE
LES CAYES
COTES-DE-FER
CAYET
PORT SALUT
Ile à Vache
EAN SEA

HAITI

CHAPTER ONE

WHY HAITI?

Once the richest French colony in the new world, Haiti is now the poorest country in the Western Hemisphere and one of the poorest in the world. In 1985, 90% of the population earned less than $150 a year. Some 90% of the children suffer from malnutrition, and life expectancy in the country is just 53 years. Only 20% of the population can read and write. Unemployment is more than 50% and about 20% of those who do work receive the $3 a day minimum wage (Kurian 1987). Haiti's economic problems are aggravated by drought, population pressure, diplomatic isolation, political repression, emigration of skilled personnel, inflation and hurricanes.

Nearly 80% of the population still lives in rural areas where the conditions are worst. Several attempts to explain rural Haitian poverty have concurred in the identification of deforestation and soil erosion as major impediments to economic well-being in rural Haiti (Zuvekas 1978, Lundahl 1979). The scope and severity of Haiti's environmental problems are difficult to exaggerate. Environmental conditions and trends in Haiti are the worst in the Western Hemisphere. Haiti ranks among a half-dozen nations in the world whose natural resource endowments are moving toward a point where rehabilitation of the resource base may no longer be possible. The deteriorating natural resource base is a serious constraint on the country's

efforts to increase agricultural production, which makes prospects for better living conditions remote for the great majority of Haitians who already live on the margin of subsistence.

There are today two primary contributory factors to ongoing deforestation and soil erosion in Haiti. The first is the overuse of hillside land for agricultural cropping and grazing. An estimated 64% of Haiti's land area has a slope more than 20° and 54% is on slopes exceeding 40° (Ehrlich 1986). The comparison between land suitability and use shows that although only 28.6% of the land area is considered suitable for cropping, pressure on available land resources has brought nearly 43% of Haiti's surface area under cultivation (Table 1). This clearing of hillside land, together with overgrazing of even marginal hillsides, has resulted in major soil erosion. Erosion reduces agricultural productivity due to a loss of soil volume, soil nutrients and water-retention capacity. Increased run-off on hillsides, in turn, has reduced agricultural productivity in lowland areas by reducing drainage and clogging irrigation systems with rocks and sediments. Agricultural production has declined in Haiti at rates estimated variously between 0.7% and 2.5% per annum since 1970 (USAID 1981).

In contrast to cropland, Table 1 illustrates a pattern of underutilization of "forest land." Although 68.6% of Haiti's surface area is considered suitable for trees, only 9.3% is currently classified as "forest" in 1978. This category in-

TABLE 1

HAITI:

LAND SUITABILITY AND LAND USE

Soil Class	Potential	% of Total Area	
II	Suitable for rainfed and irrigated agriculture; few limitations	8.4	
III	Suitable for rainfed agriculture and for irrigation of high value crops; more limitations; requires soil conservation measures	11.0	Cropland 28.6%
IV	Limited possibilities for field crops; suitable for permanent crops (pastures, trees)	9.2	
V	Severe limiting factors (salinity, drainage, fertility); requires substantial investments for field crops such as rice	2.3	
VI	Suitable for trees and pastures; requires terracing for field crops	13.8	Forest Potential 68.6%
VII	Suitable for tree crops, forestry and pastures	51.0	
VIII	Mountain areas and coastal marshes, best suited as forest or game reserves	3.8	
Total		100.0	
Total in 1,000 km^2		27,700	
	LAND USE		
	Irrigated Cropping	2.6	Actually
	Rainfed Crops - plains and valleys	10.4	cropped
	Rainfed Crops - mountains	29.9	42.9%
	Pastures	10.8	
	Forests	9.3	Actually
	Waste Land	37.0	forested
Total		100.0	9.3%

Source: International Institute for Agricultural Cooperation (IICA), San Jose 1980 Costa Rica.

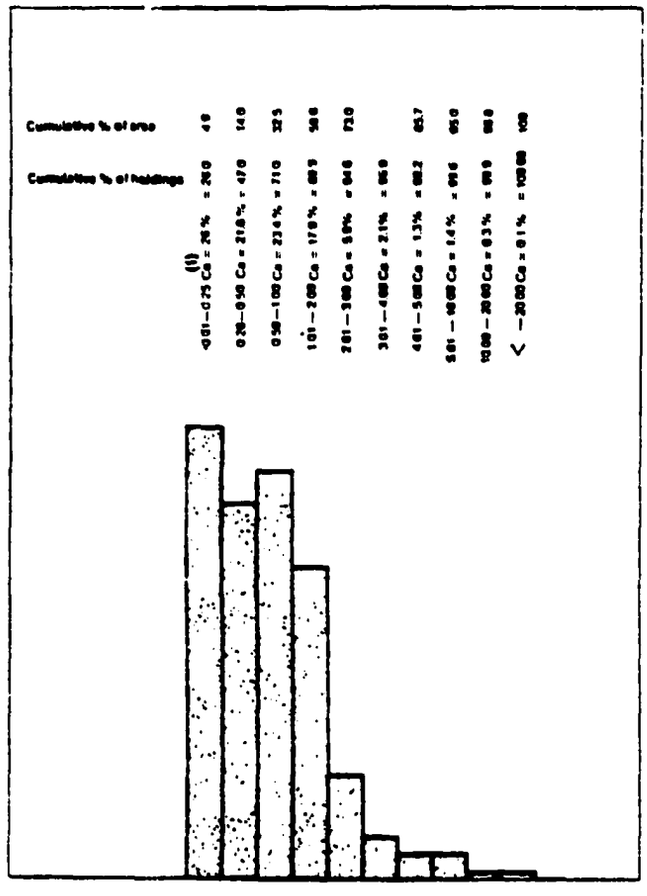
cludes also grazing land where forest cover is less than 60%. However, if we include all lands having at least 60% tree coverage, only 6.7% of the country remained covered in 1978. Since then, estimates as low as 3% have been given for the total territory still forested in 1986 (Ehrlich 1986). This disparity represents a significant waste of scarce natural resources.

The second main contributory factor is the exploitation of forest resources through overcutting. The initial ecological damage caused by overcutting occurred during the colonial period in the 17th century, when French plantation owners cleared vast areas for the production of export crops. The cutting continued in the 19th and 20th centuries, which caused irre-versible ecological shifts, particularly in the xerophytic forest areas. However, by far the major cause of excessive exploitation of forest resources today is the demand for fuel-wood and charcoal. In general, firewood is used by rural inhabitants while urban residents use charcoal. With increased urbanization, the demand for charcoal has increased at a rate estimated to be in excess of 5% annually (Voltaire 1979). Since the ratio of wood to charcoal is about four to one by weight, the increased consumption of charcoal has greatly accelerated the depletion of forest/shrub areas. Seventy-three percent of the country's energy needs derive from local wood. Between 40 - 50 million trees are cut every year, or between 6 - 8 trees per year per inhabitant (Smucker 1981).

While the large-scale cutting of trees for charcoal production is an important cause of deforestation in certain areas, overall it is very much secondary to the simple expansion of peasant agriculture under conditions of demographic pressure, erosion, shrinking farm size and soil exhaustion. These forces have trapped the peasantry in a vicious cycle of ever-diminishing returns to labor. The degree of parcelization is clearly evident; 71% of all production units (generally family plots) occupy one carreau (one carreau is equal to 1.29 ha) or less and account for 32.5% of the total cultivated area (Figure 1).

FIGURE 1

SIZE DISTRIBUTION OF CULTIVATED HOLDINGS



(1) 1 carreau= 1.29ha
Source: Ehrlich 1986

Overall population density for the entire country is 677 individuals per square kilometer (100 ha) of cultivated land or seven persons per one ha of arable land (Ehrlich 1986) which is one of the highest population densities in the world. Yet, if peasant agriculture has been the primary cause of destruction of Haiti's forest cover and widespread environmental degradation, it has been so only in response to a whole host of constraints external to peasant farming itself. Peasant farming may ultimately prove to have significant potential for positive impacts on the environment as well. In fact, traditional features of peasant farming have been instrumental in the success of current programs to ameliorate environmental degradation and reverse negative trends as will be discussed latter.

Past mitigation projects have been inadequate to meet the challenge of reforestation. Most of the projects failed for many reasons. Significantly, two factors were identified: the lack of involvement of local people, and the lack of perceived benefits of the projects by the local population. Once external funding stopped, the land improvement practices ceased. Planted saplings either died, were browsed by livestock or cut by the inhabitants. Engineering works quickly went into disrepair and, once not maintained, increased land degradation (Ehrlich 1986). However, one tree planting project, the Agroforestry Outreach Project (AOP), appears to be successful in mobilizing the small farmer to plant trees for profit. The AOP is often cited as one of the few large-scale agroforestry

projects worldwide which has been (and still is being) implemented successfully. Since new far-reaching initiatives need to be developed and implemented immediately before the last vestiges of Haiti's forest are forever lost, I decided to analyze the design and implementation features leading to the "success"[1] of the AOP. The author seeks to highlight the lessons learned in the Project which may assist the Government of Haiti (GOH) or other national and international organizations to plan and implement sustainable agroforestry projects which offer the small farmer a real chance to participate in the solution of Haiti's environmental problems.

Haiti is often referred to as a wastepaper basket case among international environmentalists.[2] They claim that even if optimal landuse strategies were immediately adopted, there is little hope that the potential productivity of the physical systems can ever return to former levels. Does this mean we should disengage from any attempt to assist the Haitian farmer breaking out of his/her vicious circle of a degrading resource base? I disagree with this view and hope to convince some of these pessimists to regain their faith in the possibility of stopping Haiti's deforestation problem while simultaneously improving the small farmers' welfare. The outcomes of the AOP and the lessons learned may motivate them to contribute toward developing and implementing immediate large-scale landuse programs.

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[1] The term "success" will be defined and discussed later in the report.

[2] R. Buschbacher, personal communication, Conservation Foundation, Washington, D.C., January 1988.

CHAPTER TWO

RATIONALE FOR PROJECT DESIGN

A. Past Forestation Activities in Haiti

1. Government of Haiti (GOH)[1]

In spite of the staggering loss of renewable wood resources in Haiti, a systematic public sector effort has never existed to manage, protect, and replace the losses by replanting. The responsibility for such an effort falls within the Ministry of Agriculture, Natural Resources and Rural Development (MARNDR), primarily to its Division of Natural Resources (DRN). Within that Division exists the Service for Soil Conservation, Forests and Wildlife, which has legal responsibility for management of public sector programs concerning soil erosion and the exploitation/ protection of forest reserves. The lack of priority placed on the activities of this service by the GOH is reflected in the fact that it received approximately 6% of the Ministry's total development budget over the five-year 1975-1981 period. Its limited personnel, with few exceptions, is poorly trained and poorly paid. As a result, GOH operational support for forestry management or extension programs has been quite limited.

Nevertheless, the GOH has expressed concern through the passing of laws and the making of public pronouncements (e.g., Declaration of the "Day of the Tree"). The chronology of

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[1] For a list of abbreviations see page xv.

Haitian laws and decrees on forests is impressive (1926, 1955, 1962, 1968, 1972, 1973), but these generally go unenforced or partially enforced.

Despite this generally limited role of the GOH, DRN has undertaken in the past and present significant activities in the forestry area through assistance projects financed by various foreign donors. Thus, the extent to which the GOH has taken positive action in the area of forestry has been a function of the projects it has co-sponsored with external foreign assistance agencies. These are mentioned below in the "Other Donors" Section.

With the change of government in 1986, reorganization of the DRN has occurred (and is still occurring). As a result, the Service for Soil Conservation, Forest and Wildlife has been changed into Service for Forest Resources. In conjunction with FAO and the World Bank, a new national forest program is being planned which intends to reforest a total of 17,050 ha by 1993.

2. U.S. Agency for International Development (USAID)

The Agroforestry Outreach Project (AOP) constitutes the first major USAIDfinanced effort directed at reforestation of Haiti. Prior to the AOP, USAID/Haiti had carried out activities mainly in the agricultural/natural resource sector. In 1976, USAID initiated a major Integrated Agricultural Development Project (PDAI). The purpose was to develop the institutional capacity of the Ministry of Agriculture to deliver

agricultural inputs and services to small farmers, focusing on selected watershed areas. The Project was confronted with many problems and suffered many delays in implementation. In 1979 it was redesigned and focused on the provision of assistance to DRN in administration and the strengthening of its services in two major watersheds (Les Cayes in Southwest, Jean-Rabel in Northwest). The amended Project also increased its effort in soil conservation, which does not call for extensive reforestation activities per se, but includes tree-planting schemes as part of the overall watershed erosion control strategy. In 1977, under the Agricultural Development Support Project, the USAID contracted with a Soil Conservation Technician and a Forestry Adviser to work with the GOH Ministry of Agriculture for two years in the Southwest Region. Their activities were subsequently brought under the supervision of the PDAI project.

Outside the PDAI project, USAID activities in forestry have been limited to the approval of several small grants (each under $5000) to provide material assistance to community councils or groups which have initiated local efforts to plant trees in rural Haiti.

3. Other Donors

FAO/UNDP: The first agency to undertake a project in Haiti involving forestry was the Food and Agricultural Organization (FAO), with funding from the United Nation's Development Programme (UNDP). In 1972 the FAO sponsored an

erosion control/ reforestation project near Les Cayes in the Southwest Region which resulted in the establishment of a GOH-supported nursery still operating today, albeit at a reduced level. Most of the conservation measures undertaken through the Project were the establishment of erosion control structures (e.g., terraces, rock walls, ditching) in the surrounding watershed areas. These were built principally through the payment of Food-for-Work rations to peasant laborers in the area by the World Food Program (WFP).

In 1977, the FAO/UNDP undertook with DRN a project which focused more broadly on watershed protection and hillside agriculture. A large program of bench terracing, hillside ditching, and contour planting of fruit and other tree species was carried out on a large demonstration area (11 ha). Again, the physical structures prepared on the demonstration plot were paid for with WFP Food-for-Work rations utilizing local peasant labor. An addition, a training school was built at the demonstration site to carry out a hillside agriculture training program to train extension agents, peasant leaders and farmers.

Interamerican Development Bank (IDB): Like the FAO, the IDB is carrying out major projects in Haiti which include forestation activities as an element of a broader development scheme. The first of these was an erosion control/irrigation rehabilitation project carried out in cooperation with DRN. The major works under this Project were the rehabilitation of the watershed's irrigation and drainage infrastructure, but

the Project zone included an area of some 2500 ha of hillside land which were planted with trees and pasture grasses to deter further erosion.

The other major forestation activity sponsered by the IDB was a small component of a massive (US $35 million) Port-au-Prince drainage/storm sewer project. Under this Project, the steep mountainside area behind the city was expropriated by the GOH and was being terraced and reforested through the Ministry of Transportation and Public Works (TPTC). TPTC hired peasants to construct contour terraces and rock walls along which a variety of tree species were planted. About 800 km of such contour terraces have been constructed to date and some 300,000 trees planted to reinforce them, but only a small portion of the entire Project zone has been covered to date.

World Bank: Up to the beginning of USAID's AOP in 1981, the World Bank had not yet undertaken specific projects in the soil conservation/forestry area in Haiti. However, it was planning a major initiative through MARNDR's Division of Natural Resources to start a project with various components such as strengthening of the Forestry Section of MARNDR, forestry education and training, fuelwood plantations, management of Haiti's last pine forest and improved cooking stoves.

Fonds Agricole (W. German): Fonds Agricole has principally worked with the Haitian American Community Help Organization (HACHO) in Northwest Haiti since 1976. It has provided technical assistance and Food-for-Work rations in

carrying out programs in agriculture, infrastructure and forestry. Four nurseries have been established which have been successful in raising seedlings although extension activities were limited. Often the tree seedlings prepared were never planted in the fields. Some plantings have been made on both private and public lands, primarily using community councils and HACHO agents as the organizing mechanism. Continous consultation was being held by HACHO, Fonds Agricole and CARE on program planning in the Northwest.

4. Private Voluntary Organizations and Community Groups

There are approximately 100 major international private voluntary organizations (PVOs) working in Haiti, plus numerous smaller ones, most of them USA and Canadian based. In addition, there is a small but growing number of local Haitian voluntary groups that are actively involved in rural Haiti and already working in rural development or agricultural activities. However, it is not clear how many PVOs are actually working in Haiti. Estimates range from 139 (PNUD 1983) to 400 NGOs (English 1984) spending US $40 million per year. In the summer of 1980, USAID/ Haiti engaged a substantial number of such PVOs in discussions of their existing activities in forestation efforts and their interest in future initiatives. These discussions led to the conclusion that although a number of PVOs had already sponsored small tree-planting programs over the years, it was difficult or even impossible to determine their true nature and success rates, due to the lack of

subsequent monitoring by the groups and the absence of records. Most of them were willing to involve themselves more activiely in tree planting activities provided the resources are available.

Few PVOs had carried out sigificant forestation programs *per se* prior to 1981. The PVOs with the greatest experience in this field were the international relief agencies, both religious and secular in character. Among the more important agencies were Church World Service, CARE, Catholic Relief Service and the HaitianAmerican Community Help Organization. The implementation of their forestry related activities were all dependent on Food-for-Work resources. These were usually short-term, public works/ food distribution programs and were not serious attempts to foster peasant agroforestry. A regular complaint heard from those relief agencies was that their attention was diverted from planning their own activities as they had to dedicate large amounts of time and energy to administer and supervise the distribution of food from abroad. In addition, these agencies often found themselves in a position of substantial economic dependence on the international agencies. This is most true of HACHO, whose very existence was threatened by the withdrawal of USAID funding at the beginning of the Project.

In addition to the PVOs, the existence of community councils and *ad hoc* community groups which have undertaken forestation efforts of various kinds should be mentioned. The GOH encouraged the formation of these councils in the 1970's

mainly in response to specific relief efforts or development projects. In fact, the Food-for-Work programs were all channeled through the community councils. Some councils remain active on a continuing basis and USAID/Haiti had received various requests for assistance in carrying out forestation activities.

There is also a growing movement in several regions to support the formation of small groups of peasants who join together to carry out income-generating activities on a collective basis. These are known as peasant groupmans. These community work groups were initially formed through the Duvalierist National Organization for Literacy and Community Action (ONAAC) and were disbanded after the flight of the ex-president. These groupmans were tied to the community councils to carry out various activities it decided upon. At present the groupmans are in the process of reorganizing with the help of various PVOs and are forming new community development organizations which are not related to the community councils anymore. Although few groupmans had undertaken agroforestry as an income-generating activity before 198[illegible], there was groupman interest in this type of enterprise. Thus, there existed the possibilities of involving such groupmans in numerous cashgenerating agroforestry projects.

B. Learning from the Past: Conceptual Cornerstones of the AOP

There have been dozens of attempts - some of them local, some of them large-scale - to implement reforestation projects

in Haiti during the past 25 years. Only a small number of these projects can be said to have succeeded, according to Murray's (1979) analysis. He refers to success as the adoption of tree planting activities by farmers as part of their own agrarian practices. Chapter IV., Section E will provide additional criteria for success as it relates to our AOP case study.

Common characteristics of past failed reforestation projects were their meager immediate economic value to the peasant, initial coercion to participate, the use of Food-for-Work or other incentives and a basic lack of social analysis in the project design. As a result, tree planting has been performed out of mechanical compliance with the conditions of temporary employment, but has not become incorporated into the economic repertoire of the peasants. One reforestation program after another had come in with the finger-wagging message that the tree should be seen as a sacred soil-conserving object which the peasant should plant, but never cut. This attitude towards trees was in accord with most Haitian laws which emphasize prohibitions against cutting trees, or the need to secure permission and/or pay a tax for the privilege of cutting a tree.

Other problems which curtailed the effectiveness of past reforestation activities were the following:

1. Peasants feared that the trees planted were not theirs. Even peasants who planted the trees on their own land were often unsure as to who owns the trees. When questioned, many

said the trees belonged to the company, referring to organizations such as FAO or USAID, or the government.

2. Excessive emphasis was placed on the concept of soil conservation relative to new economic production activities.

3. Several projects which were implemented through the community councils became vehicles for the promotion of existing governmental progams. This resulted from pressures exerted by the line ministries of the government. These pressures transformed the village-level worker from a coordinator into a salesman for line-ministry programs.

4. The pressure for quick results led to rely on the local elites and consequently led to undesirable patterns of benefit distribution. These pressures came from the GOH and international development agencies which had to comply with strict time and budget requirements.

5. Past donor agencies have focused on institution building of the public sector responsible for environmental restoration (i.e., DRN). As a result, the solution of ecological problems was implicitly treated as a second-order effect to be achieved through improving the intervention capacity of the public-sector bureaucracy. However, the chosen public sector was not capable of producing the intented outputs and benefits. Large amounts of funds were spent on organizational strengthening with little immediate performance payoff. By emphasizing the institution-building aspects of development and by measuring their own performance in terms of timely and properly accounted for funds disbursement, the donor agencies have misplaced

their efforts in seeking to produce sustainable benefits for the rural poor. Thus, new organizational structures had to be found capable of channeling external resources and expertise to its intended beneficiary group.

Learning from the failures of past reforestation activities in Haiti, USAID/Haiti decided to start a new approach to treeplanting. Several anthropologists were contracted to provide background information and project design recommendations. The Project then was designed largely on the basis of these recommendations (Murray 1979) and some earlier ethnographic literature on the socioeconomic dimensions of village life already available. As we will see later, inputs from anthropologists also played a salient role in project implementation. The USAID/Haiti Project Officer position was initially held by an anthropologist in addition to two Project directors of the largest portion of the grant (PADF). The use of anthropologists in both design and implementation endowed the Project with several theoretical characteristics and a particular action orientation that depart somewhat from standard international development approaches. The differences between the new and the old, often called blueprint approach, are briefly discussed in Chapter IV.,Section A.

The AOP is based on the major premise that the Haitian peasant is too impoverished to afford the luxury of being seriously concerned with "soil conservation" as a long-term objective. As a result, widespread soil conservation will occur in Haiti only as a secondary effect of innovations whose

primary function from the point of view of the farmer is the generation of a higher immediate cash income. In fact, Murray's analysis of an effective erosion control project based on vegetable growing, concluded that peasants adopted erosion control devices, not to protect their soil, but to protect their investment in fertilizers (Murray 1979). Thus, the most promising erosioncontrol strategy for most of Haiti was based on the concept of promoting fast-growing wood as a privately owned cash-crop planted by peasants on their own land. Two elements in Haitian economic behavior lend themselves to the adoption of tree cropping, a practice virtually unknown in Haiti. First, cash cropping is universal in Haiti; there is probably no small farmer who does not produce crops for sale in the highly developed marketing system. Second, the harvesting and sale of wood was already an elaborate and important element in rural incomes (see Conway 1979 and Voltaire 1979). The AOP proposed the joining of the two behaviors: instead of cutting natural stands of trees, a way could be found to enable the small farmers to produce the wood they sold. The growing demand for wood could be turned to an advantage and tree cropping could become a new central element in the rural economy.

Regarding the implementation of the Project, USAID decided to bypass the GOH and provide grants to two PVOs with established grassroots networks and working relationships with a large number of local groups involved in rural development in Haiti. A third PVO was involved with seedling production and experimentation with nursery technologies.

Briefly, the problem of past failed reforestation projects stems from the failure of project planners to demonstrate convincingly and then to exploit the economic potential of certain fast-growing tree species based on agroforestation, which Murray (1979) describes as the integration of profit-generating tree planting with tradtional cultivation. The problem thus resided in the behavior of planning and implementing institutions which mainly focused on the physical and technical aspects of erosion control and viewed the peasant as an obstacle. The AOP focused on the economic system promoting the adoption of trees in such as way that they will mesh with, rather than interfere with, the pre-existing agrarian and livestock economy. As a result, the peasant is viewed as a positive element, and indeed as the only possible agent of environmental restoration in Haiti. In addition, past projects overemphasized the technical aspects of tree planting without recognizing the importance of the institutional, organizational and motivational dimensions of the task. The new AOP tried to incorporate these past lessons into its alternative design and implementation approach.

CHAPTER III

THE AGROFORESTRY OUTREACH PROJECT: OVERALL FRAMEWORK

A. Project External Task Environment

This Section outlines the difficult and constrained task environment in which the AOP had to be implemented. The focus will be only on the external dimensions of the task environment since the internal dimension will be explained in Chapter IV.

Project designers and implementers have relatively little control over the external task environment, such as national policies, bureaucratic procedures, existing capabilities and interests of other organizations, natural and societal conditions under which the Project has to operate, etc. Thus, the challenge for the designers was to accommodate the AOP with the existing conditions and yet to bring about changes.

Natural/Physical and Societal Conditions: Haiti's alarming degradation of its resource base has been described in Chapter I. Its position in the tropics and its mountainous terrain have created extreme weather conditions and temperature regimes which vary greatly with altitude. Rainfall patterns range from less than 300 mm in the Northwest to more than 3,000 mm in the mountains of the Southwest. Tropical storms, hurricanes, droughts and floods are frequent. Given its mountainous terrain, approximately 64% of all lands have

slopes greater than 20%, where most of the country's marginal lands are found. The AOP is intending to cover the entire country and therefore has had to adjust its agroforestry techniques to the diverse climatic and edaphic environment. To sum up, the project had to operate under very harsh and uncertain natural conditions, such as bad quality of land, droughts and hurricanes. In addition, the rural farmers to be reached are very dispersed and hard to reach due to a lack of or inadequate infrastructure.

The land tenure system deserves a special word because of its complexity. Compared to other agrarian societies of the Western Hemisphere, Haiti bears the distinction of a low rate of landlessness and a low incidence of large absentee-owned land concentrations. The concentrations that do exist are small in comparison with the latifundios of Latin America and account for a low percentage of Haiti's land. The peasant of Haiti is then more often a proprietor than are his/her counterparts in many other societies.

The dynamics of the land tenure system are guided by the following principles. The contemporary agrarian economy of Haiti is based on the premise of private property, and officially, access to a given plot of land rests in the possession of legal title to the land. However, there is a prevalence of informal land divisions on inherited plots in order to avoid paying fees to the land surveyor and notary. Thus, land divisions are rarely legalized. The result of this process of bypassing involvement with formal authorities is the almost

total absence of individualized deeds to the hundreds of thousands of tiny plots that are being cropped throughout the nation. Probably fewer than one percent of the cultivators in rural Haiti could present a valid, individualized title to each and every one of the plots which they report themselves as owning. This lack of individualized land title could have an impact on the number of farmers who can participate in the AOP program since they have to prove somehow they own the land in order to be eligible for tree seedlings. Fortunately, this requirement has been loosened and an undivided land title within the family is sufficient now to prove land ownership.

Peasant tenure is of "mixed" character where farmers generally work several plots simultaneously under different arrangements (e.g., owning, renting, sharecropping or leasing their own land to others). Most plots in the land tenure system are being sharecropped. The typical cultivator begins as a sharecropper, purchases land in his/her mid-thirties, and in turn shares this land out with other tenants in the community, nonetheless remaining a tenant on one or more plots himself/herself. An intricate web of intracommunity sharecropping emerges as the backbone of the contemporary land tenure system. Fragmentation of land-holdings averages between five and six plots per family. One by-product of this fragmentation is that the actual plots on which food is produced are truly small, much too small to support anything than labor-intensive agrarian activities. Thus, trying to introduce agroforestry practices widely under those circumstances does not seem rational from the farmers' point of view.

The complex tenure arrangements, the diverse farm strategies resulting from the great variation in climate, the highly scattered pattern of multiplot farm units and the dynamic land tenure system complicated the AOP's effort to engage farmers in tree planting. In addition, many farmers were distrustful of foreign agencies due to past bad experiences and were cautious of participating in any new program.

National Policies and Political Context: The Project had to operate within a highly unstable national context. Policies regarding soil conservation were unsupportive of the AOP and had the potential to undermine its efforts. For instance, laws existed prohibiting tree cutting or levying a tax upon its cutting, though they were generally unenforced and ignored by the public. Given the weak institutional landscape and lack of political commitment in the GOH to restore its natural resource base upon which future economic development depended, the Project decided to operate independently of the national government. Thus, no formal linkages existed between the AOP and the GOH. The Project designers and implementers assumed that the national policies and lack of involvement of the GOH would not affect the eventual Project success.

The GOH has established several mechanisms to control social and political relations at the district and lower levels which has often suppressed the emergence of local leadership or the formation of local organizations. The Rural

Section[1] emerges as the basic unit of local government, which constitutes perhaps the most critical administrative unit since more than eight out of ten Haitians live in such Rural Sections. The government of the Rural Sections has been taken out of the hands of the civil administration and falls strictly under the jurisdiction of the military. Thus, the rural hinterland is governed by members of the military apparatus. A hierarchy of rural police power exists which penetrates every village. Under the former President Duvalier, a civilian militia was formed (the tontons makoutes) which serve as an internal police force of peasant affairs. The military status of these authority figures would be somewhat difficult for the outsider to detect by simple visual inspection. But, many tontons makoutes are known to abuse their authority to benefit themselves through coercion, blackmailing and bribes. In fact, the tontons makoutes are expected to generate most of their own income in the course of their activities. Thus, if a tonton makoute becomes an animateur, the farmers may plant trees out of coercion or fear and not necessarily because of a change in attitude towards trees. For sustainability reasons however, the Project decided to work within the existing local power structures, taking advantage of the already existing leadership. According to the Project design, it was up to the local organization to choose animateurs who in some cases will inevitably be from the local power elite.

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[1] The Rural Section is the lowest level of Haiti's contemporary governmental administration in rural areas.

Capabilities of cooperating organizations: Many of the PVOs with which the two implementing agencies decided to cooperate were marked with serious resource shortages, limited technical skills and experience with forestation activities. Their organizational capabilities were too weak to implement major tree-planting activities. Thus, the AOP was first confronted with the task of building and strengthening the existing poorly- organized PVOs before it could engage them in any implementation tasks.

Bureaucratic Regulations: The AOP is funded by USAID which contracted with two non-governmental organizations (NGOs) for its implementation. USAID was originally designed for the more centralized, service-oriented so-called blueprint approach, and its structures, systems and norms pose important barriers to effective local participation. Its rules and procedures are inflexible, control oriented, overcentralized and unsuited to local variations and unanticipated changes. The implementing agencies had to comply with certain USAID procedures and regulations which affected their flexibility to carry out their Project activities and stimulate local participation. This theme will be further elaborated in Chapter IV., Section A.

All these conditions operated as a constraint upon the choice of intervention strategies that could be pursued, as well as upon the eventual success of the chosen intervention. Let us now turn to the description of this chosen intervention.

B. Project Description

The AOP started in September 1981 with a four-year budget of US $11.5 million. The project was then extended, first for 15 months in January 1985 with another US $3.5 million and then an additional three years (AOP II) until December 1989. Total funding of AOP I and AOP II was US $22.8 million.

1. Goal and Purposes

The long-term goal of the Project is to reduce and ultimately reverse the ongoing degradation of Haiti's natural resources, and thereby raise the productive potential of its land. The Project, of course, cannot achieve this goal by itself, but it represents an important initial step in the Mission's overall strategy in the natural resources area. It is a results-oriented, high-impact initiative to demonstrate that the cumulative process of deforestation, soil erosion and declining agricultural productivity can be slowed and perhaps even reversed by organized peasant farmer action.

The Project is called an "agroforestry outreach" Project. An exact definition of agroforestry has been developed by various advocates and practitioners of agroforestry, but it is defined by the Project designers as the planting of denuded or cultivated lands with appropriate tree species in a way that is consistent with and complementary to the prevailing agrarian economy in any given area. Project activities are not attempting to take land out of food production in order to plant trees. Rather, the Project is focusing both on inter-

cropping of trees with food crops and on the intensive cropping of wood or fruit trees on land not being used for food crops.

The primary purpose of the Project is to motivate Haitian peasants to plant and maintain six-to-nine-million trees in Haiti over the life of the Project (four years). This target has been revised under the extension and AOP II to 27 - 30 million trees. A secondary purpose is to obtain reliable information on the technical, economic and social variables of reforestation in Haiti. The trees planted under the auspices of the Project are planted with one or more of the following objectives in mind, each of which may be considered a subpurpose of the Project.

Soil Conservation: Trees will be planted on hillsides and in watersheds as part of an effort to stimulate farmers to protect their eroding land resource. Other soil conservation measures (e.g., contour ridging, construction of terraces, use of check dams, etc.) will also be undertaken as part of the subprojects of the implementing agencies which are responsible for the specific design of these subprojects.

Increased Supply of Fuelwood: Since domestically produced wood and charcoal currently provide 73% of all energy consumed in Haiti and the supply of wood resources is diminishing quickly, prices are rising at an alarming rate. Given the high cost of alternative fuel sources and the favorable marketing opportunities for charcoal, the achievement of this subpurpose will increase the supply of wood for energy in Haiti and

stimulate wood-production as a cash crop for farmers and others.

Income Generation: As mentioned previously, the Project places a major emphasis on the generation of income through cash-cropping of trees. The Project will attempt to illustrate to peasants the feasibility of planting and maintaining fast growing, coppicing tree species that provide the possibility of a relatively near-term harvest of wood. Attempts will also be made to secure the rental of currently unproductive, privately and publicly-owned lands through intermediary organizations. These lands can then be utilized for tree production by landless local farmers.

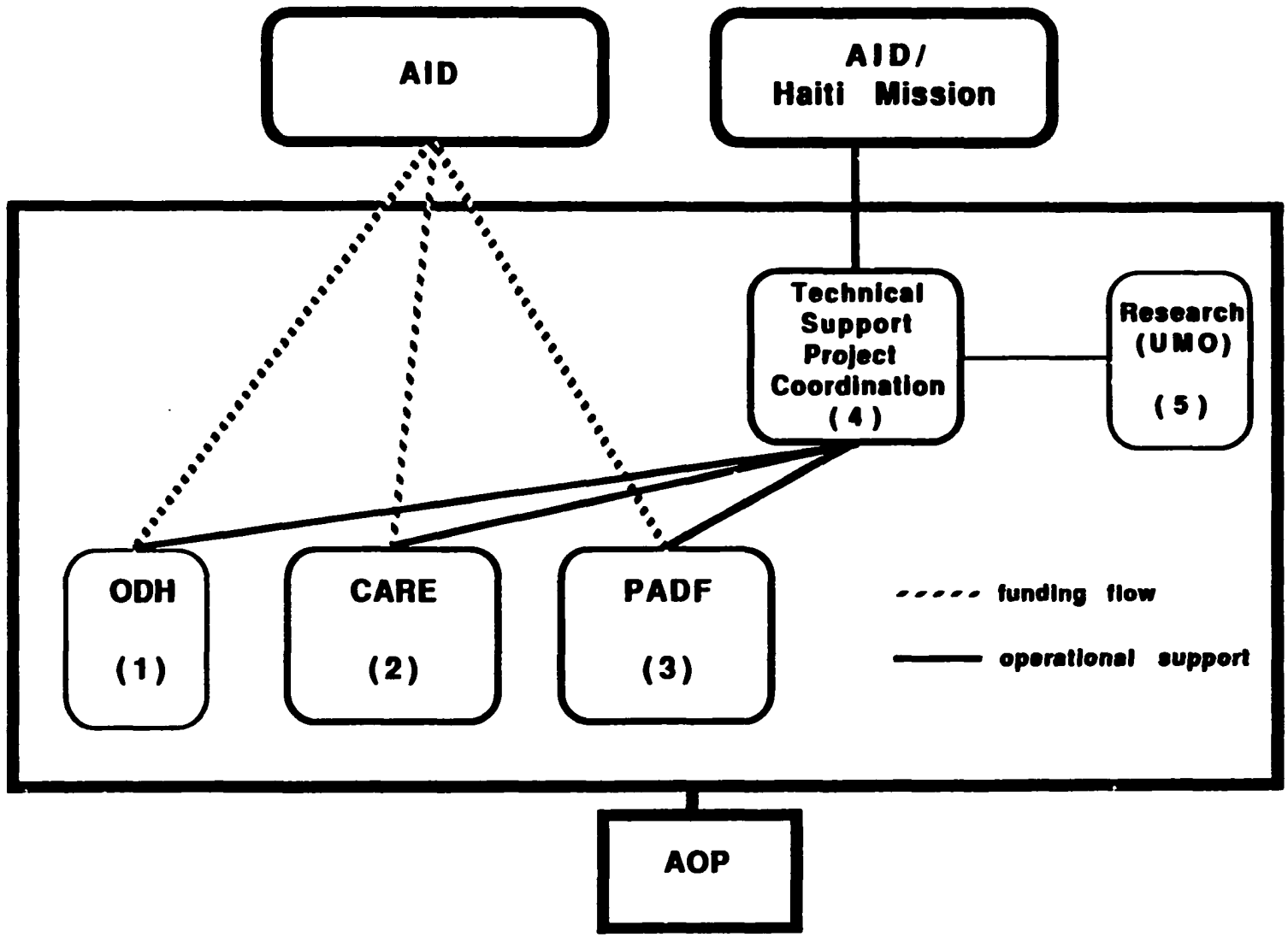
These Project goals, purposes and objectives remain unchanged under the extension of the Project and AOP II.

2. Project Components and Implementation Arrangements

The Project is actually an umbrella for five separate project components (Figure 2). In 1981, three components were financed through separate grant agreements with established PVOs in Haiti, and the fourth through arrangements with the USDA and personal services contracts. The four components are Operation Double Harvest (ODH), Cooperative for American Relief Everywhere (CARE), Pan American Development Foundation (PADF) and the Project Coordination/Technical Support Unit. The Technical Support Unit was established within the USAID/Haiti Mission. These four original arrangements were all extended under the Project extension and, in 1985, a fifth

FIGURE 2

AOP ORGANIZATIONAL STRUCTURE



Note: For abbreviations and acronyms see text or list of acronyms and abbreviations at beginning of this report.

component was added when a research contract was awarded to the University of Maine at Orono (UMO). The 18-month research component was added to better pursue the Project's secondary purpose of information generation. It included the investigation of a number of specific topics touching on socio-economic and technical aspects of agroforestry in Haiti. This research component will not be discussed further since it had no direct impact on the Project to facilitate the monitoring and evaluation process of the implementation agencies. In fact, it was the conclusion of the PVO field representatives and agronomists that the research agenda of the UOM was not responsive to their field needs, nor did it lift the burden of research off their shoulders (see Talbot 1986).

The contribution of the ODH component will only be briefly discussed since its program targetted large private landowners and State lands in the Cul-de-Sac Plain, demonstrating the feasibility of large-scale tree plantations on marginal lands. The idea was that such plantations, if successful, might ultimately supply a significant portion of the urban demand for fuelwood, charcoal, poles and lumber, thereby reducing pressure on rural forest resources and ameliorating the nation's wood-based energy crisis.

Given the emphasis of this report on designing and implementing agroforestry projects benefiting small farmers, and given that the principal target group of the Project are small landholders, the focus of this report will be on the implementation agencies CARE and PADF.

2.1. Operation Double Harvest

Operation Double Harvest is a USA based, non-profit organization. It is dedicated to the extension of modern agricultural methods and the demonstration of proper landuse in selected developing countries. ODH came to Haiti at the invitation of the Haitian Minister of Agriculture in 1978 to establish a 70-acre demonstration farm. The relatively small size of the USAID grant finances a portion of ODH activities only in the area of forestry and ODH continues to carry out its agricultural work with its own funds.

In general summary, ODH has been responsible for large-scale nursery experimentation and tree seedling production, select seed storage and distribution, the establishment of large tree farm demonstrations or "charcoal plantations" near Port-au-Prince and a program of adaptive research. In these activities, it was to support the outreach efforts of CARE and PADF mainly through its timely provision of tree seedlings to the various local PVOs until decentralized nurseries had been established.

2.2. Cooperative for American Relief Everywhere (CARE)

The CARE program has focused on the Northwest Peninsula, where it has worked in rural development for many years. A minimum number of PVOs are established in this region, which meant that CARE needed a more direct implementation model rather than working through subgrantees as PADF did. The original Project involved significant collaboration with the

Haitian American Community Help Organization (HACHO) to carry out jointly the provisions of the US $2.35 million USAID grant. HACHO was originally a quasi-Haitian multi-function regional development organization in the Northwest. It carried out a variety of public works projects through community councils and utilized food-for-work resources. It was also carrying out an nursery program in four areas of the Northwest and was eager to to expand this program to other parts of the Northwest. Under the USAID grant, CARE was to assist HACHO in its regional forestry program and to enhance its effectiveness through greater outreach efforts than had been possible previously. However, HACHO was dissolved in November 1983 and CARE had to assume the entire Project responsibilities by itself. HACHO was replaced by the Organization for the Development of the Northwest (ODNO), a regional organization under the Ministry of Planning. ODNO is still getting started and CARE's involvement with them remains limited. ODNO has provided agronomists for the CARE project as well as collaboration in soil erosion control and fruit tree production and distribution.

The final goal of this Project is to preserve the productive capacity of agricultural land owned or farmed by small farmers in Northwest Haiti. The intermediate objectives to be met in attaining the final goal are to:

1. Develop one or more replicable and economically viable agroforestry project models for continued application in Northwest Haiti by the end of the Project, and

2. Assure the adoption of tree-growing as an appropriate land-use practice and income generating activity by small farmers in Northwest Haiti by 1989.

The final goal continues to apply to the Project during the extension period and AOP II. The objectives have been slightly revised under the AOP II to refine the Project's replicable outreach networks for application in the Northwest and other areas where government and non-governmental organizational (NGO) presence is weak or not operational; to refine regional seedling production systems; to continue and expand on-farm research activities and to collaborate with the independent research institution (i.e., UMO); and to continue and to systematize agroforestry training programs for all levels of Project personnel.

Organizational Structure: CARE's central office is located in Gonnaives. In Phase I, the project established three regional field offices and added a fourth under Phase II. These are Bombardopolis, Jean-Rabel, Passe Catabois and Bassin Bleu (see Project area map in Appendix 1).

CARE hired an expatriate Regional Administrator with forestry experience and two Regional Foresters with field experience in Haiti. The Administrator is coordinating activities in the field, expediting the paper work and serving as liaison with USAID, PADF, ODH and other organizations associated with the Project. The two Foresters are primarily responsible for organizing the extension component of the Project and overseeing nursery operations. Each of these Foresters is supervising two Haitian Agronomists/Extensionists and two Nursery Managers. Each of these "teams" also utilized

community agents or "Animateurs"[2] to intiate contacts with community councils and other groups. Their role is principally to motivate farmers to participate in tree planting activities. The organizational structure is portrayed in Figure 3.

Outreach Progam: In Phase I CARE generally carried out its activities directly through its two agroforestry extension teams. Its approach was to establish central nurseries producing large numbers of trees with a relatively high input of modern technologies such as rootrainers, commercial nursery growing media and chemical fertilizers. Five of these nurseries have been established (1987), each producing an average of 150,000 seedlings per planting season. These nurseries are staffed by CAREemployed nursery managers and nursery workers. In addition, CARE began a pilot program with 22 decentralized community-level nurseries, owned and operated by local groups or individuals. During the AOP II, this decentralized nursery concept is being expanded and will include the involvement of elementary schools. Another component of the outreach program which has evolved over the last several years is the pilot program for the demonstration and extension of Leucaena living hedgerows for soil conservation and alley cropping. Over 88 ha have been treated through 1986. In AOP II, this component will be extended. CARE also intends to provide composting and mulching and toconstruct rainwater catchments for soil conservation. A new component to be added in AOP II is improved

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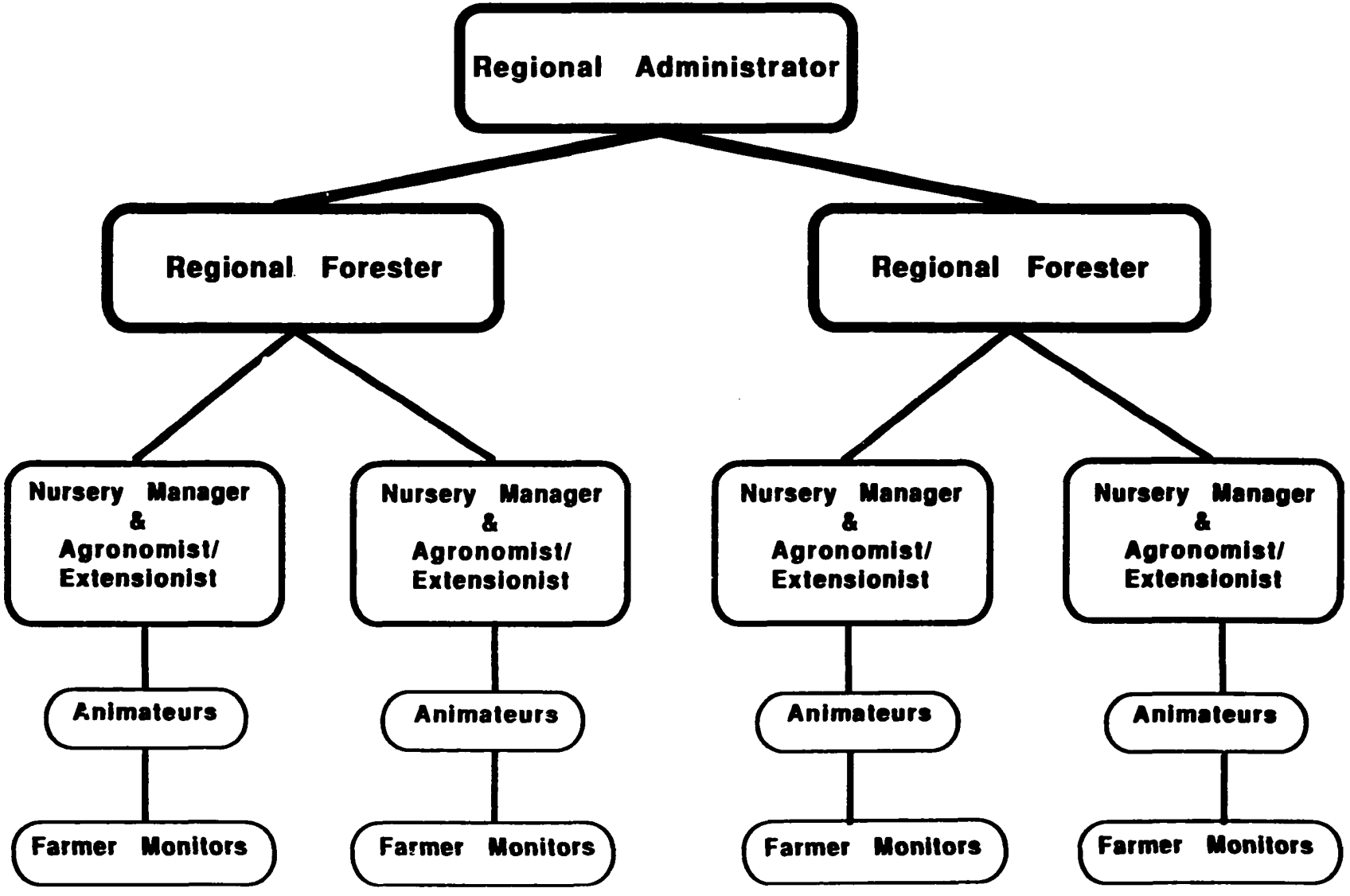
[2] The role of Animateurs will be further described in Chapter IV., Section B.

FIGURE 3

ORGANIZATIONAL STRUCTURE OF CARE (AOP I)

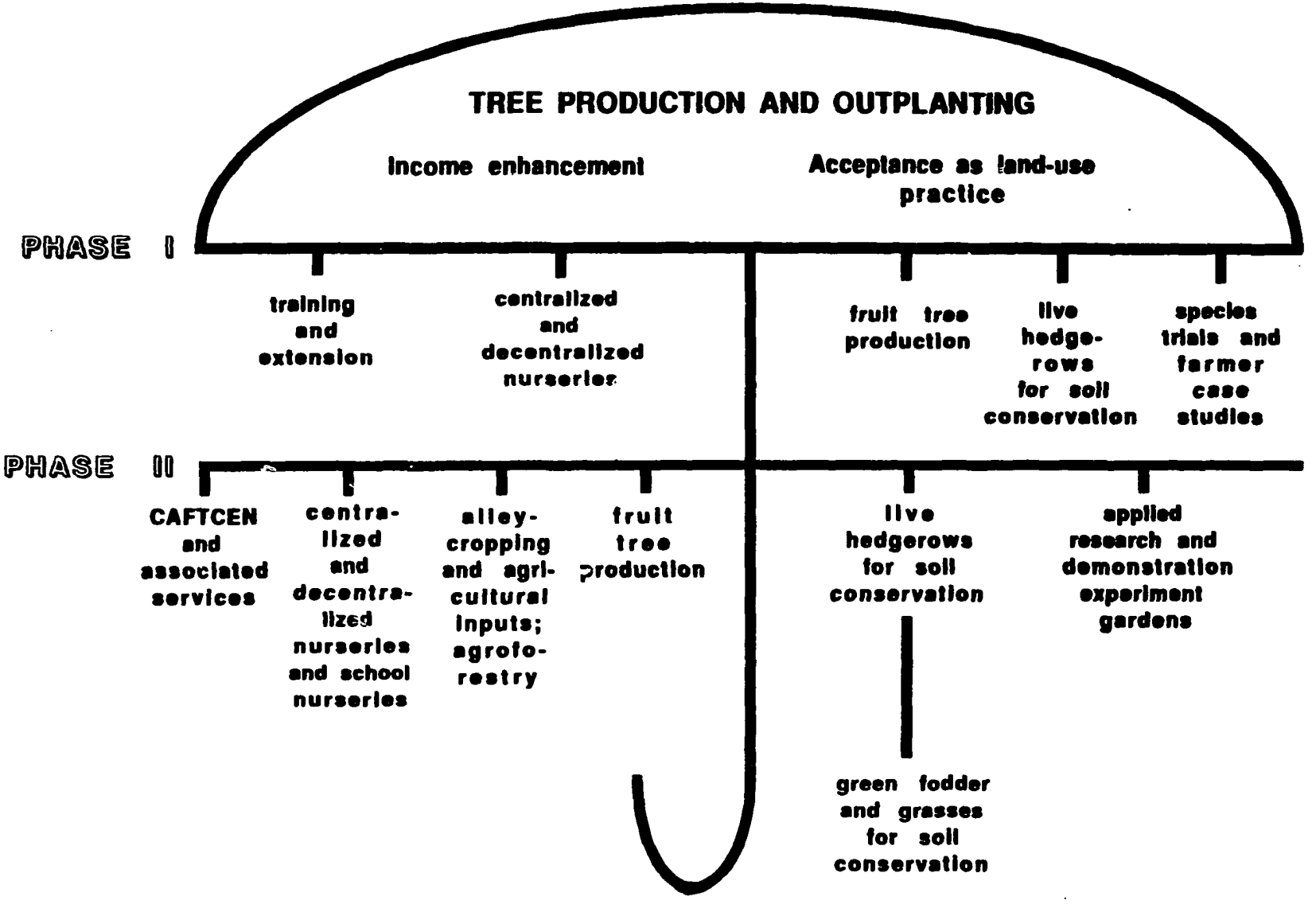


farming and crop management to help farmers improve their crop yields. The training and extension component which provides formal and informal training to project staff and village extension workers will be further refined during the AOP II with the addition of a Project Training Officer, the designation of a local-hire Training Officer in each outreach region and the establishment of the CARE-Agroforestry Outreach Project Training Center Network (CAFTCEN). These regionally based training centers will provide the technical facilities and space to accomodate regular training sessions, establish demonstration plots and produce and utilize multi-media training and extension materials. In addition, an expatriate technical team will be hired to provide technical support to the overall program. Many village meetings, workshops with farmer groups and village councils are planned. A complete list of CARE's End-Of-Project Outputs is given in Appendix 2 and Figure 4 provides a schematic umbrella of its activities.

Staffing Pattern: At the start of AOP I, three International staff people were hired: one Administrator and two Regional Foresters. The following Haitian staff was hired: Four Agronomists/Extensionists, four Nursery Managers, 16 Monitors, one accountant, one clerk and three drivers. At each central nursery, 12 local workers were hired. At the end of AOP I (1986), an additional Agronomist, 11 Animators and 59 Monitors were hired. Under AOP II, three additional expatriates were hired: an Agroforester/applied Research

FIGURE 4

SCEMATIC UMBRELLA OF CARE'S ACTIVITIES



Specialist, a Forester/Nursery Specialist and a Project Training Officer. In addition, all four of the regional team leadership positions will be assumed by national staff members. They will each be assisted by one senior and two junior level Agronomists and will supervise the regional team of Animators, Monitors and nursery personnel.

Monitoring and Evaluation: The reporting system (see Chapter IV., Section 4) is the basic ongoing Project monitoring tool. Intermediate targets are set for each quarter, and quarterly results are measured against these targets. Each year, Project senior staff hold a three day retreat for reflections on past year's activities and for reassessment of Project directions. The underlying approach to monitoring and evaluation is a fluid one. As more is learned about the area and various project interventions, specific goals and targets will be changed to reflect the actual situation. This method ensures a flexible programming design that responds to changing ecological and sociological/ cultural conditions.

2.3. Pan American Development Foundation (PADF)

The Pan American Development Foundation, with headquarters in Washington D.C., is an independent, non-profit organization established in 1962 by citizens of the United States, Latin America and Caribbean.

The PADF Proje Pyebwa (Haitian Creole for "the tree project") supports activities in the areas of seedling

production and distribution, outreach and training, and applied research. The long-term goals of Proje Pyebwa have remained unchanged since the early phases of project implementation. These are to protect the productive potential of Haiti's land and to generate income in rural areas by promoting tree growing and other ecologically sound land use practices by small farmers.

The specific objectives of the program are to:

1. Motivate Haitian peasants to establish and maintain viable agroforestry systems which have a benficial impact on soil and water conservation,
2. Improve agroforestry practices and techniques through the establishment of agroforestry demonstration areas and the training of counterpart Haitian "animateurs agroforestiers,"
3. Develop the agroforestry training program for all levels of the outreach program and provide training to personnel from other afforestation programs,
4. Refine seedling production and distribution systems and
5. Encourage the weaning of collaborating private voluntary organizations (PVOs) from PADF subsidization as they develop the capacity to become independent.

Outreach Program: PADF operates its entire program through a preexisting network of PVOs, two-thirds of which are affiliated with one or another church. In most cases, these groups have already established some form of community organization or development project which works directly with the Haitian peasant farmer. Under a system of subcontracts between PADF and the local PVOs, PADF provides a local PVO with planting stock and technical and managerial assistance. These PVOs, in turn, develop extension teams (animators) who give seedlings to the farmer and introduce him/her to appropriate

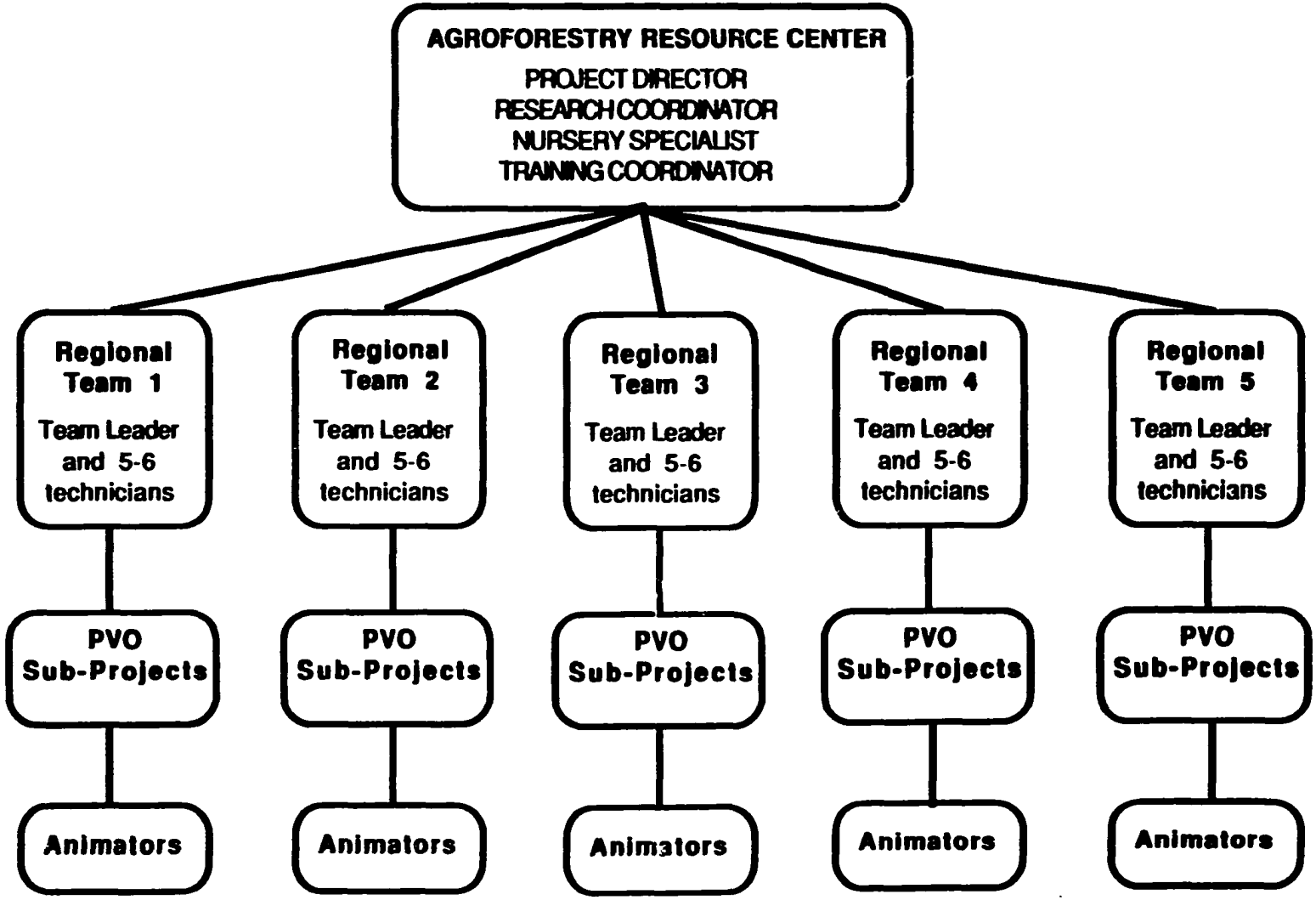
crop establishment and management techniques. Those PVOs with adequate capability also develop and manage nurseries for the production of planting stock. During AOP II, PADF will continue its present level of outplanting while improving training materials and PVO expertise. The period of consolidation will also focus on additional research and documentation of the program and agroforestry systems.

Organizational Structure: Proje Pyebwa operates in all of Haiti except the Northwest peninsula (see map in Appendix 3). In order to implement the Project, PADF established an Agroforestry Resource Center (ARC) in Port-au-Prince where general and technical staff provide backstopping and technical support services to regional production and outreach efforts across the country. Initial field activity began in three regions and expanded to five, each headed by a regional field team. These field teams serve as a liaison between the PVO and the Proje Pyebwa office in Port-au-Prince. Each team is responsible to select collaborating PVOs and to assist them in establishing subprojects. The organizational scheme is presented in Figure 5.

Staffing Pattern: The ARC is headed by an expatriate Project Director and a Management/Financial Officer. To improve Proje Pyebwa during AOP II, a three-person technical assistance team was hired and based at the ARC to monitor and enhance performance in the areas of applied research, extension, nursery production, seed selection and procurement. The team consists of one expatriate Research Coordinator and

FIGURE 5

ORGANIZATIONAL STRUCTURE OF THE PADF



Nursery Specialist and a Haitian Nursery Assistant. In addition, all five of the regional teams will be "staffed up" to include either five or six Agricultural and Forestry technicians, headed by a team leader. Team leadership positions in the five regions are currently held by expatriates in three instances, and by Haitian Agronomists in two. In those regions headed by an expatriate, the field team will have a national Agronomist counterpart for general administrative assistance and coordination of training. This pattern of co-leadership will be used to train national staff capable of assuming team leadership or comparable positions beyond the end-of-project in the future. The participating PVOs provide and pay for their own personnel.

2.4. Project Coordination/Technical Support

The "umbrella" nature of the Project required an overall coordinator to assure that the whole is greater than the sum ofits parts. This liaison role was created to ensure that field activities would be consonant with the purposes of the Project and that the resources to facilitate these activities flowed smoothly.

The grantees each agreed in their contract with USAID, to utilize the USAID Project Coordinator and technical support staff to coordinate its operating norms and procedures with the other grantees in order to maximize uniformity of standards and infor-mation exchange, particularly with respect to research, seed and germplasm improvement, training, monitoring

and reporting. For this purpose, an informal Forestry Advisory Committee was formed at the outset of the Project. The Committee consists (in addition to the Coordinator) of the USAID Project Manager, representatives of each grantee organization and representatives of other local and international PVOs involved in agroforestry activities. The grantees also have to consult with the Project Coordinator concerning the recruitment, assignment and training of key personnel, as well as concerning any changes in staffing pattern which might alter the existing configuration of managerial, administrative, supervisory and technical responsibilities among key personnel. Further, through the joint US Department of Agriculture Forest Service and USAID funded Forestry Support Program, special technical assistance is provided to the grantees to ensure that the research plans of the grantees are well-designed and implemented. If the grantees are faced with particular technical problems during the implementation of their programs, they can apply for short-term technical assistance through the Project Coordinator.

3. Linkages to Other USAID Projects and Long-Term Strategy

Initially, the AOP was to complement the activities undertaken with the DRN through the Integrated Agricultural Development Project (PDAI) described previously (see Chapter II., Section A.2.). Given that Haiti lacked technical data on climate, soil types, prevailing land use, species suitability, etc., the Project was viewed as an experimental medium-scale

research effort, which was to yield significant technical, economic and social information on reforestation and soil conservation in Haiti. This information was to be useful for designing future USAID efforts and for the GOH and other donor agencies interested in reforestation and soil conservation projects. The AOP I together with the PDAI project was thus regarded as a foundation-building phase from which a more extensive outreach program could be supported. USAID envisioned two parallel approaches to building a full-scale, national natural resource management program by the end of the decade. One was to continue with its efforts to strengthen DRN's capability in soil conservation, forestation, irrigation, research and extension areas and to undertake a new watershed management program. The second was to provide additional support to PVO outreach programs, perhaps combining agroforestation and soil conservation activities with other employment generating activities into a larger NGO resource center. However, this ambitious program strategy encountered major obstacles, mainly deriving from the GOH. Due to serious political instabilities and change of government, the DRN was reorganized in 1987 and is still in the process of elaborating a new national forest program. As a result, virtually no collaboration has occurred between USAID and GOH in the natural resource sector. Also, no linkages have been created between the AOP and the DRN and this will reduce the possibilities of future GOH and NGO collaboration in natural resource management.

However, the information generated under the AOP will provide the supporting backbone to the recently approved USAID Les Cayes Watershed Project. Also, the nurseries of the AOP are supposed to provide the seed and plant material required to establish vegetative barriers in the Les Cayes Project.

4. Limitations of the Project

The AOP is conceptualized principally as an income producing, not as a reforestation Project. Tree planting locations are selected by the farmers and in almost all cases trees are not planted in areas where the trees either maximize their role in the control of soil erosion or water conservation. In fact, the purpose of the AOP is eventually to harvest the trees. Thus, very little emphasis is given to the erosion control function of the tree in the current modus operandi of the Project. The three year extension period however, intends to promote more conservation-based farming techniques. The Project is based on the assumption that agroforestry systems can restore the soil fertility of Haiti's degraded mountain slopes. However, no scientific data are currently available to back up this assumption. In fact, all successful agroforestry systems which have proven to improve soil conditions are found on relatively fertile soil (see Sanchez 1987). Given this uncertainty of the tree's impact on marginal soil, the Project risks to bypass its main goal, to reverse the ongoning degradation of Haiti's natural resources and improve the production potential of its land. This is due to shortcomings

in the technical knowledge base concerning agroforestry when the Project was designed.

The underlying concept of the AOP was that agroforestry and other soil conservation measures should be undertaken on an individual basis, even though the benefits would increase if all farmers on a hillside invested in such measures simultaneously. For this reason, it was unnecessary, the Project thought, to strengthen local groups such as the groupmans since their main objective was to carry out activities communally. Thus, the Project does not contain as one of its objectives the promotion of stable forms of peasant self-organization which could themselves mobilize and support the active involvement of peasant groups in other development activities besides tree planting. Hence, the advantages and social synergy of group-powered efforts have not been tapped.

Further, no studies of existing traditional agroforestry systems in rural Haiti had been conducted before 1986. Thus, these systems have been completely ignored in the design of the AOP and were not regarded as a base from which peasant systems could be expanded and improved (see Balzano 1986).

Even though these limitations exist, their negative impact can be reduced through the adoption of a flexible project implementation approach which both CARE and PADF have done. The only limitation which poses a real problem is the assumption that agroforestry systems can restore soil fertility. Many years of research beyond the AOP timeframe are required to test this assumption. Unfortunately, Haiti's

alarming environmental situation does not permit to wait 15-20 years before any tree planting activities can occur which are based on the results of the agroforestry research. Thus, there was no way how the AOP Project designers could have avoided this limitation.

CHAPTER IV

IMPLEMENTATION APPROACHES

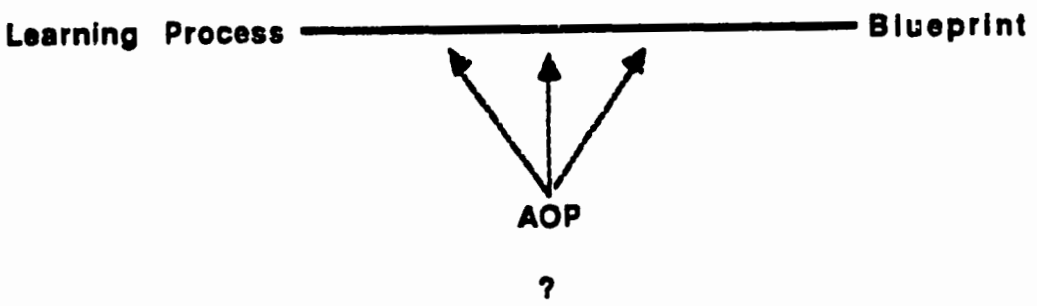
A. Overview of Implementation Approaches: The Blueprint vs. The Learning Process Approach

The most controversial feature of the Project is the nongovernmental nature of its implementation without any assistance of the GOH. The funds come principally from expatriate public sectors. But, the main implementers at the top are citizens of several donor nations working in collaboration with hundreds of private local Haitian organizers. The AOP implementation approach is based on the widespread and well-founded belief that development funds entrusted to the GOH may never reach the peasants in any useful form. In fact, based on previous reforestation activities with the GOH, there is good reason to doubt whether 30 million trees would have been planted had the Project gone through the local public sector channels normally entrusted with such funding.

Trying to classify current rural development implementation approaches is a complex task and is not the purpose of this report. It suffices here to note that there is a continuum of approaches between two extreme project development models: The so-called "Blueprint" and "Learning-Process" approach. This Section outlines the main features of both approaches and tries to place the AOP on this continuum (Figure 6).

FIGURE 6

THE AOP "LEARNING PROCESS" / "BLUEPRINT" CONTINUUM



The blueprint approach (BPA) is typified by certainty on the part of the designers that the technology and intervention techniques previously identified are appropriate and, given good management, will work in a certain environment. It assumes that solutions to problems are known and that projects are merely vehicles for applying them. Projects are implemented through conventional bureaucratic structures in which the project strategy and targets are formulated centrally with little regard to the willingness or capability of the project beneficiaries to respond. Given this centralized approach, inadequate attention is given to deal with social diversity and highly stratified social structures. The implementing organization adhers to detailed plans and shows the following

characteristics which are commonly associated with the BPA:

1. Denies errors,
2. Plans projects centrally with little or no interaction with beneficiaries,
3. Differentiates sharply between the roles of researcher, planner and administrator which separates knowledge from decision and from action and
4. Prefers projects that show quick results and are quick to implement and are capital-, technology-, and import-intensive.

In addition, the projects designed under this blueprint strategy lack sufficient integration of technical and social components and have the nature of the problem ill-defined. Also, projects have a low staff/project cost ratio. Further, different people participate in the different phases of the project cycle and substantial knowledge is lost due to a lack of transfer from one individual to the next. Often, the only knowledge base an individual has are the documents written by the team or person in the previous phase. Sometimes not even these documents are read due to time pressure. There is limited personal communication to transfer some of the "unwritten" experience and knowledge.

Recent development experience has produced a mixed record for projects designed in this manner. Their programming procedures are better suited to large capital-intensive projects than to people-centered development. Clearly, some development activities, such as road construction, need to be well specified prior to implementation. But, other rural development projects designed in this way have a high incidence of failure precisely because of their inflexibility, neglect of data

gathering and field testing aimed to improve implementation and their assumption that appropriate interventions are known in detail. It is often argued that such projects constitute only time-bound resource transfers which cannot stimulate sustainable development processes (Korten 1980).

In contrast, the Learning Process approach (LPA) begins with the notion that, more often than not, we have little knowledge of which specific interventions are likely to work best over the longrun. Complexities in local social, economic and political systems make process model designs less clearly detailed than blueprint designs. Selected interventions are tried, field tests are frequently conducted, and project activites are redesigned in accordance with what is learned. Projects are modified and adapted as knowledge is gained about their specific environments. Thus, the LPA is based on a dialogue with the people in the project area. Ideas are shaped into project components with the participation of the local people who will be responsible for carrying out the project. The LPA requires time and is often a slow change process; it extends well beyond the programming cycles of most donor and planning agencies and requires long-term commitment, patience and continuity of leadership. It relies for planning and implementation of projects on local organizations which have the capacity to respond to diverse community-defined needs, and can build from the local skills and values. Other characteristics of the LPA are:

1. Embraces error,
2. Links knowledge-building with action by integrating the different roles of the researchers, planners, administrator and local farmers,
3. Requires a high ratio of people to financial input,
4. Prefers small projects with no time or funding limit and
5. Builds on existing systems.

A contrast of both approaches is provided by Table 2.

Korten (1980) posits three stages of the learning process over time.

1. **Learning to be effective:** Developing an appropriate solution to locally defined problems and an effective response mode.
2. **Learning to be efficient:** Reducing the cost of response to achieve a fit with available resources, designing appropriate management systems and operating routines and building a cadre of competent staff.
3. **Learning to expand:** Applying the systematized problem definition and response capacity on a wider scale and to new development problems.

These three stages can be thought of as sequentially overlapping learning curves that the organization moves along with the help of the working group. Figure 7 illustrates this graphically.

The LPA as a concept has been documented by a variety of rural development specialists. It has been applied to the Gal Oya Irrigation Project in Sri Lanka (Uphoff 1985) and has influenced the project design in several PVOs. However, the implementation of this approach is still in an experimental phase and few applied case studies are available. One explanation might be that the LPA is practiced by small

TABLE 2

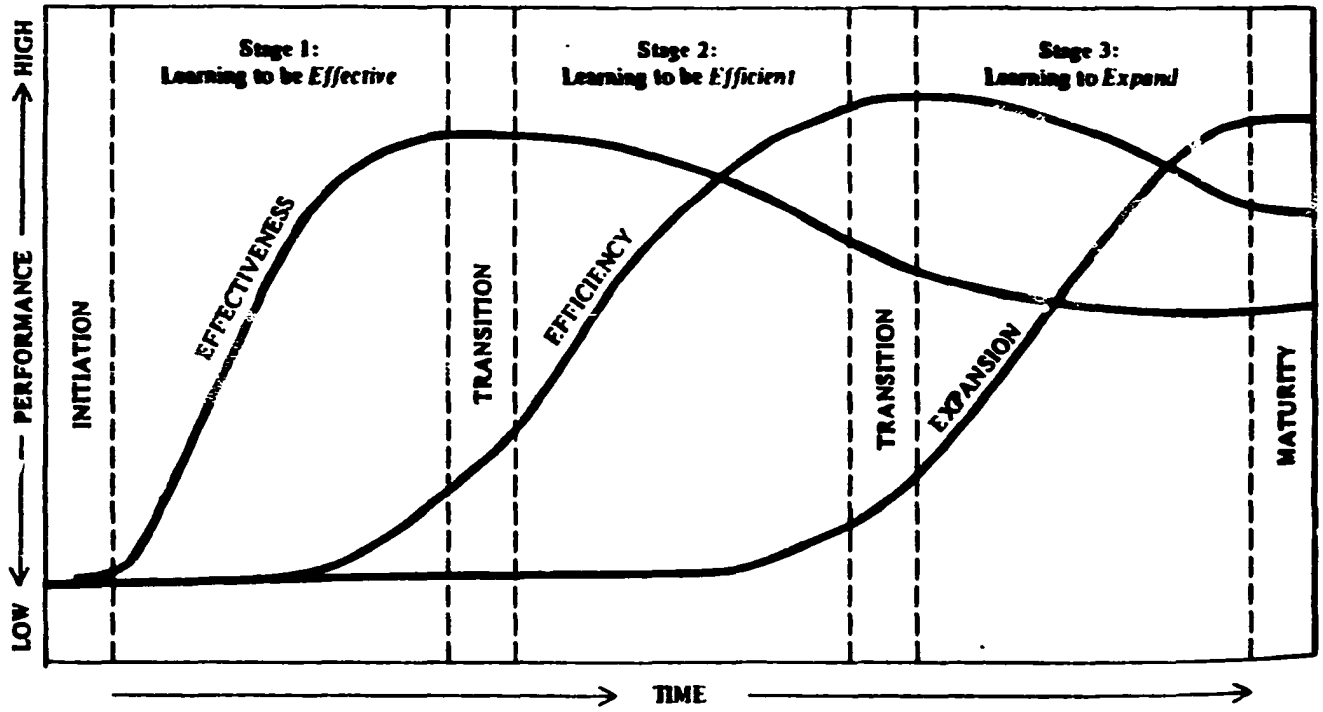
THE BLUEPRINT AND LEARNING PROCESS APPROACHES IN RURAL DEVELOPMENT CONTRASTED

	Blueprint	Learning Process
idea originates in	capital city	village
first steps	data collection and plan	awareness and action
design	static, by experts	evolving, people involved
supporting organisation	existing, or built top down	built bottom-up, with lateral spread
main resources	central funds and technicians	local people and their assets
staff development	classroom, didactic	field-based action learning
implementation	rapid, widespread	gradual, local, at people's pace
management focus	spending budgets, completing projects on-time	sustained improvement and performance
content of action	standardised	varied
communication	vertical: orders down, reports up	lateral: mutual learning and sharing experience
leadership	positional, changing	personal, sustained
evaluation	external, intermittent	internal, continuous
error	buried	embraced
effects	dependency-creating	empowering
associated with	normal professionalism	new professionalism

Source: Chambers 1986:23, adapted from David Korten personal communications.

FIGURE 7

PROGRAM LEARNING CURVES



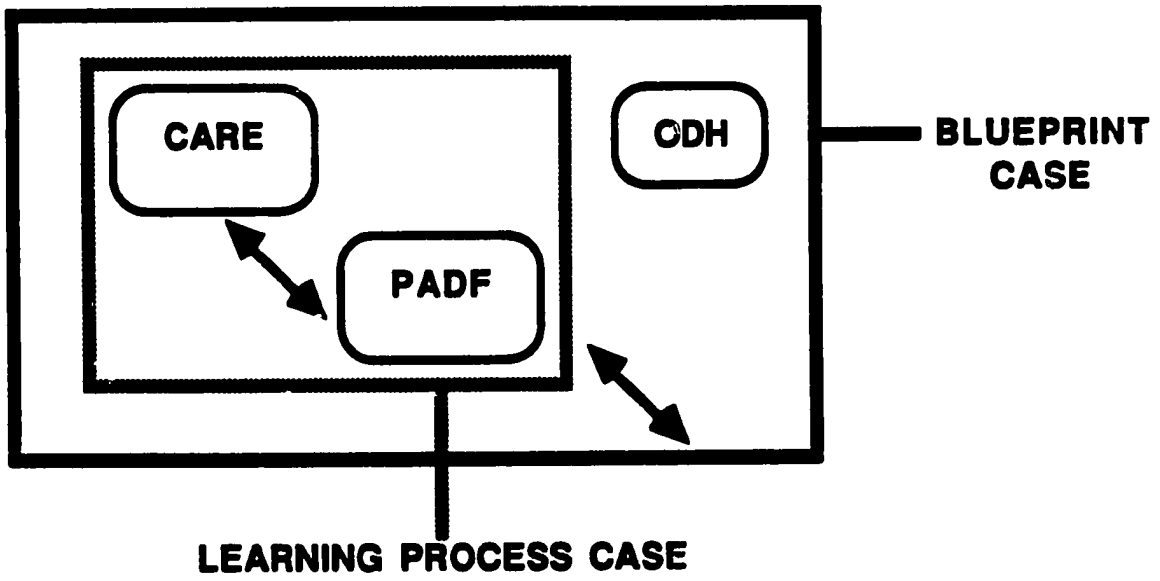
Note: It should be expected that some effectiveness will be sacrificed in the interest of efficiency and expansion. With expansion efficiency will likely suffer due to trade-offs with the requirements of expansion.

Source: Korten 1980.

organizations which are not concerned with or in a position to share their experiences with other organizations. They may not have the incentive or resources to publish their knowledge. Thus, many practical aspects of this new approach remain in the heads of the practitioners. How can we tap this source of knowledge and convey it to other organizations and agencies interested in new approaches?

It is important to understand that this new LPA "model" is not a static one like the BPA and therefore it is difficult to develop a methodology. The LPA is a flexible, dynamic approach which cannot be taken out of its context and replicated elsewhere without modifications and adjustments. The next section tries to uncover some of the positive achievements of the AOP approach and its limitations given the context under which it had to operate.

The AOP is a curious mixture or hybrid of both approaches:



The blueprint case represents the requirements and procedures of USAID. The learning-process case represents the two different learning approaches of CARE and PADF. The author is interested to examine two main interactions and comparisons.

1. Within the learning-process case, what distinguishes CARE's from PADF's implementation approach?
2. Given that the learning-process approach had to operate within the blueprint environment, what were the limitations which curtailed its effectiveness? How would the Project have been different if entirely designed according to the blueprint approach?

The blueprint features of the AOP are as follows:

1. A capital budget has to be spent by a certain deadline.
2. Targets are set for physical achievements such as the number of tree seedlings planted.
3. Initially the Project was developed by expatriates in accor dance with standardized procedures that detail in advance what will be done and how.
4. Most of the leader and organizational positions were held by expatriates during AOP I[1].

The following are some key elements of the learning-process approach in the AOP which could not have evolved in a blueprint approach:

A knowledge-building "savings-account" developed due to the continuity of the same professional staff in the various phases of the Project. The cultural anthropologist G. Murray

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[1] In AOP II, CARE turned over some of the key personnel positions to Haitian counterparts and PADF established co-leaderships to train national staff.

who was hired by USAID to conduct pre-project design studies, was able to draw on an extensive knowledge base due to prior residence and study in Haiti. His involvement continued through the Project design phase; he was the principal contributor in designing the Project for USAID. Then, he was hired to head the larger of the two NGO umbrella organizations for two years (PADF). He was succeeded by another anthropologist who was very familar with the former director's work and the rationale behind the Project. During his years of involvement with Haiti and the AOP, Murray had accumulated a body of knowledge which he took with him from one phase of the Project to another. Thus, in the early stage of the Project, all three roles of researcher, planner and administrator were combined in a single individual to ensure that the generated knowledge was not separated from the decision-making process and from action. Later on in the Project there was a good rapport between the researchers who worked closely with operating personnel and top management spent substantial time in the field. Such integration is essential to achieve and sustain rapid, creative adaptation which is characteristic of the learning process approach. Most of the research undertaken by each implementation agency served mainly the purpose to manage the Project and for internal monitoring and evaluation. Thus, very little information was disseminated outside the organizations. The mid-term evaluation report conducted by USAID considered this a major constraint to the Project's performance. As a result, USAID decided to incorporate a major

research component into the Project and contracted with the University of Maine to carry out studies separately from the direct operational control of the implementation agencies. This lack of linkages between the researchers and Project implementers is another reversion to the BPA. After a predetermined time, the research team will be disbanded and the researchers will return to the University to analyze and publish their data. What remains is an idea reduced to paper while the implementing organization has been bypassed. This linkage between research and implementation is necessary to adapt new ideas and findings to local circumstances.

Both implementing approaches are characterized by a high-staff to Project cost ratio. For instance, CARE through 1987 allocated 58% of total project costs towards personnel (see Appendix 4 for CARE and PADF budgets). In addition, they both learn from their past mistakes through their quarterly evaluation and constant monitoring system. Thus, periodic adjustments are made to improve the performance of their outreach programs. They also decided to build on the existing system (local missionary groups, groupmans, PVOs) rather than to create new organizations.

The AOP also incorporated experimentation, client participation and ongoing feedback as explicit design and implementation features. In addition, Korten's development stages of the learning process approach are clearly visible in the AOP implementation history. Dramatic effectiveness at delivering trees, securing the active participation of peasants and crea-

ting outreach capacity has led to a concern for effficiencies. There have been further program shifts as the Project expanded, with highly focused extension services to boost survival rates and train farmers in appropriate tree management.

How would AOP have differed if entirely designed in the BPA? First, no pre-project study of the economy and social organization of the peasants in the region would have been conducted. The Project design would not have been based on past lessons from previous soil conservation projects. Second, the Project would have been designed by technicians focusing mainly on the technical problems of reforestation rather than viewing the organizational, motivational and educational tasks as equally if not more important. Third, the planning and implementation phase would most likely have been centralized and authoritarian without including the communities in important operational decisions. Fourth, the execution of the Project would possibly have relied on the formation of simple work gangs paid by food-for-work. Fifth, few feedback mechanism would have been built in the Project to allow for self-corrections as the Project proceeds. Lastly, people would have been fitted to the Project rather than the other way around. The needs and capabilities of the "target group" would not have been identified and people would have been seen as the "problem" or main obstacle in the implementation of the Project rather than as the "solution."

What distinguishes CARE's from PADF's implementation approach? As has been seen in Chapter III., CARE operates its

own extension network through its Animators and Monitors while PADF enters into agreements with existing PVOs which implement the extension component of the Project. Thus, CARE has more direct control to manage the proper implementation of its activities while PADF is dependent on the institutional and administrative capacities of its subgrantees.

Concerning their Learning-Process Approach models, PADF's and CARE's program learning curves are different. PADF's early Project emphasis was to establish an outreach effort geared toward the distribution of enormous numbers of seedlings by PVOs. As a result, seedling survival and growth rates were very low in the early project phase. Thus, its focus was on expansion which according to Korten, is the last stage of the LPA. In AOP II, PADF has decided to consolidate its program focusing on the quality of support services rather than the expansion of tree planting or geographic coverage. In order to become more effective, it plans to enhance tree survival and growth rates. PADF will focus on institution and capacity building of the sub-grantees through training programs for all levels of the outreach program particularly the Haitian counterpart personnel. It will also continue to conduct an applied research program to regularly monitor and analyze the findings of its extension program to improve its effectiveness. This increased commitment to the quality of technical and outreach performance requires an increase in cost-per-seedling. This goes against Korten's second stage, learning-to-be-efficient, which is concerned with the reduction of input requirement per

unit of output. On the other hand, PADF makes an effort to move toward this stage during AOP II through its focus on institutional development. This gradually weans some PVOs from financial dependence on PADF subgrants and simultaneously eliminates others which are not performing well. PADF will also start pilot efforts in seedling sales to peasant clients to move steadily towards achieving sustainability of their efforts.

CARE in contrast has more closely followed the program learning curves outlined in Korten's LPA model. It started with two centralized nurseries and slowly expanded to five during AOP I. At the beginning, its focus was on successful introduction of tree planting activities into a small number of communities. CARE used the same implementation strategy when it made the transition from phase one to phase two of Korten's model, attempting to reduce its inputs through the establishment of the decentralized nursery system. First, pilot community nurseries were established as demonstration models to which peasants from other communities were brought in an effort to expand the program into a much larger Project area. However, CARE moved to the expansion phase before it had reached a high efficiency level in the community nurseries. This will be discussed further in the sustainability Section of this study (Chapter VI).

B. CARE'S PROJECT IMPLEMENTATION APPROACH

1. Nursery Operations and Seedling Distribution

1.1. Central Nurseries

CARE's approach has been to establish five regional nurseries, each producing an average of 150,000 seedlings per planting season. During AOP II, five additional regional nurseries will be established. These central nurseries rely on imported modern technology such as the rootrainers, soil mix, chemical fertilizers and pesticides. In addition, a high technical knowledge is required of the nurserymen for the successful rootrainer seedling production. The main advantages of the rootrainers are the rapid seedling growth, reliable seedling quality and ease of transport which are all vital characteristics upon which the extension component depends. Thus, the seedling production system depends upon well-trained and regularly supervised nurserymen. This dependence is reflected in the intensive schedule of training and supervision. As a result, CARE has developed a very effective nursery operation system with a well trained cadre of nursery personnel capable of producing a large number of indigenous and exotic multipurpose trees. They are produced and delivered to the sites on a timely basis according to previously established planting schedules.

During the first three planting seasons, seedlings were provided from ODH and transported by truck to various delivery sites until the regional nursery system was established. Farmers picked up their seedlings at those sites, or the

Monitors would deliver to those farmers at a far distance. Initially, each farmer was required to plant at least 500 seedlings on his/her land but this requirement was gradually reduced to 200.

1.2. Community Nurseries

In order to experiment with alternatives to the mass-production rootrainer system, CARE started a decentralized community or family nursery system in 1986. Twenty-two such nurseries have been established which use plastic sacks, bare-root and locally-produced soil mix. Each nursery produces between 5,000 and 10,000 seedlings per planting season. The managers of the small nurseries receive a short-course in nursery management, the necessary seeds and materials. Five to seven cents are paid per viable seedling prior to the tree distribution and all community nursery workers receive a salary from CARE. Farmers pick up their seedlings at this local nursery.

CARE expects that in the near future, such small nurseries will produce a major portion of the total seedlings planted by the Project each season. Such decentralization will require an enlarged supervision network which is planned for the AOP II phase.

1.3. School Nurseries

Beginning in 1987, CARE started to incorporate elementary school nurseries into its overall program. Each selected

school has a parcel of land devoted to growing relevant tree species. Students, learn to operate the nurseries and will be able to take seedlings home for planting. CARE believes that an understanding of the importance of trees and proper planting and management techniques, when introduced at a young age, will have long-term positive effects. The CARE Agroforestry Training Center (CAFTCEN) will serve as the venue for school teacher training. In addition, CARE will work with the joint CARE/GOH Integrated Child Nutrition and Education Centers to establish nurseries and tree gardens in these areas.

1.4. Species Diversity

In response to the demands of participating farmers and in accordance with the variable microclimates of the four regions, the nurseries are growing 24 different tree species (15 multi-purpose and nine fruit tree varieties) supplying a range of products and uses including timber, fuelwood, forage, construction poles and fruits. Five of the most widely used species are nitrogen fixers that also support crop growth. A list of the native and exotic tree species distributed in the AOP is provided in Appendix 11.

2. Extension and Training System

The Project design document emphasized that first priority must be given to the motivational phase of the activities so that the timing of nursery and planting operations are

synchronized with the groundwork established in advance by the extension agents.

2.1. Demonstration Plots

Two months before the first seedlings were distributed in Spring 1982, demonstration areas were prepared and planted with ODH seedlings. As the Project proceeded, demonstration plots were established with pilot farmers so that other neighbor farmers could come and visit. The establishment of the CAFTCEN centers during AOP II also provides for demonstration plots where future farmers are exposed to new planting techniques and exotic species. Seminar and workshop participants also gain hands-on experience on these plots in such areas as pruning and grafting.

2.2. Information Flow

The Project has three levels of information dissemination. The first is the continual exposure to current technical literature by senior staff, including the Project Manager, International Forester and Senior Agronomist. The second is dissemination of this information to CARE's own community-based extension staff, and the third is further dissemination to participating farmers.

2.3. Strategy

CARE's training and extension is an on-going process and the key ingredients are: 1) community participation, 2) lis-

tening and encouraging discussion and 3) constant monitoring to observe impact.

2.4. Training Scheme

The ultimate goal of CARE's training and extension activities is to motivate farmers to incorporate simple, relevant techniques to improve tree survival and growth rates. The training schedule has been developed with this in mind and is described in detail in Appendix 5.

2.5. Audio-visual Material

The Project staff also has developed flip charts with local peasant drawings which are used by the Project Agronomist and some Animators. The flip chart series focus directly on particular problems which have surfaced in the project farmers' tree plantations. In addition, FAO and World Neighbors' film strips are used to train Animators and Monitors. A Project-wide radio network was also to be installed this year to facilitate the animation phase.

2.6. Incentives

CARE established initially a maintenance scheme based on the number of trees that survived since it was worried about inadequate maintenance and protection of the newly planted trees. Each participant received a direct payment of US $.05 cents per surviving tree at six-month intervals for a period of one year. This incentive scheme, however, was abolished

after three planting seasons due to the enthusiastic farmer participation in the program. With the start of its fruit tree component in 1985, CARE decided to give five fruit trees as an incentive to farmers who have already planted trees with the Project and have shown themselves to be conscientious participants.

To sum up, the extension system encompasses farmer group meetings, village council meetings, site visits by agronomists, on-farm extension by Monitors and workshops for farmers and senior staff. In addition, each year, all Agronomist (12), Animators (16) and Monitors (120) receive training to update and improve their skills. Each season a new set of farmers is trained in tree-planting activities (approx. 3600). School children will also be trained in tree management techniques and regular training seminars and workshops are provided to the community, school and centralized nurseries.

3. Monitoring and Evaluation

Senior staff continually assess the effectiveness of the farmer training efforts through regular site visits which try to reach at least 10% of the participating farmers. Each Agronomist will make approximately 145 site visits per year to assist farmers in deciding on a planting configuration, location and type of trees to adopt. At the same time he/she collects socio-economic data on the farm unit and technical data on the tree performance in order to construct profiles of at least one percent of the planters. These field visits by the Agronomists and the Monitors' questionnaires and the nursery record-keeping system serve as the main tool to monitor and evaluate the performance of the outreach program. To measure achievement of the intermediate goals, the following indicators are monitored:

1. Number of trees planted and surviving more than 12 months
2. Volume and value of wood represented by surviving trees
3. Number of landowning farmers involved in planting trees on their land
4. Number of farmers planting trees on self-motivated basis and
5. Number of trees planted and maintained by self-motivated farmers.

The Regional Administrator prepares quarterly progress and financial reports to USAID on CARE's current and planned agroforestry activities during the next quarter. The final quarterly report of the calendar is prepared as an annual report which also includes CARE's detailed implementation and work plan for the coming year and the projected annual budget.

These submissions serve as a basis for joint USAID/CARE review of Project progress.

USAID will conduct an end-of-project evaluation for the purpose of evaluating progress and recommending possible continuation of the Project in 1989. CARE will hold its own inhouse Project evaluation for the same purposes.

4. Research and Demonstration

Since Project inception, CARE has concentrated on implementation activities centered around community participation, extension, tree production and environmental education. Only a limited amount of staff time and resources have been devoted to research. The applied research currently undertaken focuses on collecting and analyzing data from 15 species performance trials in different ecological zones. In addition, senior extension staff administer questionnaires that provide information on planter socio-economic status, site descriptions and community feedback on the applicability of CARE's technical package. Trials are also being conducted on nursery practices such as containers and innoculum. To extend the results of these trials within and beyond the Project, a series of technical bulletins have been prepared.

In AOP II, CARE is hiring an expatriate Agroforestry Systems Expert (AFE) in order to integrate field operations with relevant site specific research. As mentioned before, the USAID/UMO contracted research has been removed from CARE's field activities. Thus, the AFE will be the principal CARE

contact with other entities conducting research under AOP. It is hoped that there will be better coordination and standardization for all reporting undertaken by this new research system.

CARE looks upon research as a form of demonstration and extension. In AOP II, CARE will experiment with new farming methods, research tree-crop interactions and develop demonstration gardens. All research plots will be on the fields of interested farmers and on CAFTEN grounds. The objective of this component is to provide a visual verification for all farmers in a given area in terms of what possibilities exist in the areas of alley cropping and hedgerows, local potting mixes, innoculation (Rhizobium/Frankia/mycorrhizal), product diversity and small-scale irrigation systems. Results will be used to increase the effectiveness of the entire extension package. In addition, documentation will aid other researchers searching for data on the Northwest and on semi-arid agroforestry practices in general.

C. PADF's Project Implementation Approach

As mentioned before, Proje Pyebwa operates its entire program through a network of community based organizations, that is, NGO's or PVO's. What services does PADF provide in order to carry out tree planting activities? The Project offers grants and technical support services for PVO tree production, distribution and follow-up of fast-growing hardwood seedlings as a peasant field crop.

1. Subprojects

The regional field team meets with various local PVO's to familiarize them with the philosophy, goals and procedures of Proje Pyebwa. Local PVOs include missionary groups, development agencies, community councils, farmer cooperatives and private individuals. In turn, Project staff familiarize themselves with the PVO's activities, the ecology of the region and the types of trees that would be appropriate. In concert with the PVO, the field team contacts as many peasants as possible and explains the Project. Based on these meetings, a joint decision is made on whether or not to proceed with a local subproject. If the decision is positive, a formal contractual agreement is established between PADF and the local PVO. This agreement specifies each party's contributions and responsibilities, the number of trees to be planted, the number of peasant participants and the follow-up to be carried out to monitor the survival of trees planted.

An agreement is also entered into with the peasants, in which the conditions for participation are clearly spelled out: To plant a minimum of 500 trees on each farmer's own land.

1.1. Tree Distribution

There are a few direct grants of tree seedlings to local community organizations, but most of the program is based on 1) tree distribution agreements with PVO's providing tree extension services directly to small peasant farmers and 2)

PVO nursery production agreements, whereby PADF agrees to purchase tree seedlings conforming to certain standards and deadlines. When a subproject agreement is signed, the PVO selects local extension agents (animators), and PADF provides training, a degree of supervision and cash subsidy for animator costs.

1.2. Nursery Development

Once a PVO proves itself competent in tree planting and extension, PADF is willing to assist in nursery construction. The local PVO supplies land and the water system, and PADF provides the technology, shadehouse and other nursery supplies on a credit basis. PADF takes seedlings from the nursery's first crops as repayment for these advances. When PADF recovers its costs, the Project continues to purchase seedlings at the standardized rate of US $0.75 per tree from which the nursery is able to derive a small profit. This constitutes an incentive for the PVO nursery to produce quality seedlings and to generate a surplus fund.

In brief, PADF provides financial support to local PVO's through direct cash advances and through the sale of nursery supplies. To support this system, PADF buys and inventories nursery supplies and then charges these costs to PVO nursery subprojects on a cash or credit basis. Usually by the second season, the new PVO nurseries are free of debt and have repaid their advances. Cash advances are made to PVO extension subprojects for animator payments. The PVO submits animator

payment receipts to the team leader who approves them and requests an advance from Project headquarters. Each PVO arranges its own payment scheme to pay the animators ranging from monthly salaries to payment by the number of participants recruited. In this system, each regional team leader (a forester or agronomist) manages a portfolio of 10-to-20 PVO subprojects. In 1986, the Proje Pyebwa network of 80 subprojects, including 30 small container nurseries, provided seedlings to 30,000 farmers.

1.3. Institutional Development

In general, PADF seeks to strengthen local PVOs as institutions undertaking activities in nursery production, seedling distribution and training and extension. Further, it refers interested PVOs to other sources of funding and assists them in preparing the proposals. Finally, it refers PVOs to other sources of support services unavailable from Proje Pyebwa.

2. Extension Program

Each PVO has extension agents, or animators, who work directly with the tree planter. Proje Pyebwa's extension program strives to properly train and motivate animators to effectively do their job. The primary elements of the Proje Pyebwa extension program are demonstration and training.

2.1. Demonstration

To demonstrate to farmers how quickly the trees grow and how exotic species can be used, PADF encouraged participating

PVOs to plant plots of trees near churches, schools, roads, marketplaces and other highly visible places. Many of these demonstration plots are now utilized for training participating farmers, animators, assistants and others. In addition, the establishment of just a few rootrainer nurseries served as demonstrations for other PVOs which eventually established their own nurseries. These nurseries repeatedly serve as training sites for nurserymen from other PVOs. The Project also assisted PVOs to establish some agroforestry demonstration plots (i.e., Leucaena and corn) and has established several Leucaena living terraces for erosion control.

2.2. Training

The primary recipient of training are the Animators who in most cases are themselves farmers. Each year Animators attend one or two training seminars lasting two or three days in order to learn technical skills, motivation techniques and the Animator's role. A sample of an animator's seminar curriculum is given in Appendix 6. The Animators are also trained in the use of information sheets and registration forms.

Training Seminars are held at least annually for project assistants and subproject coordinators, many of whom assist with animator seminars. Nurserymen receive on-the-job training, and attend seminars at least once a year. All training is in Creole. Project staff assist in training participating farmers by conducting pre- and post-planting meetings, tree delivery meetings and several field visits to farm site tree

plots. However, the animator is the person most directly involved in the training of tree planting farmers.

2.3. Role of Animator and Extension materials

The animator is required to make a minimum of three visits per year to each participating farmer and his tree plots. The animator uses the Registration Form (see Appendix 7) to enroll the farmer in the Project and visits the proposed piece of land where the farmer intends to plant trees (to offer counsel on tree species, planting systems, etc.). He/she then proceeds to discuss the principles and technical points listed on the Registration Form. The Animator also assists with the pre-planting seminar and the meeting with farmers at the time of tree delivery. The second visit is done one week after tree delivery to inspect the trees and to encourage the farmer to correct their work if the trees are not planted properly. The third site visit is conducted between 8 and 12 months after tree planting and serves to advise the farmer on better tree management (weeding, pruning and protection). The Animator also refers the farmer to the Information Sheet to encourage him or her to study it.

The Information Sheet (see Appendix 8) is a small booklet which serves as a guide to explain project principles, the benefits of trees, different planting systems, tree species used by the project, etc. The Information Sheet accompanies the Registration form and is given to each tree planter. Farmers are encouraged to study the guide, refer to it when-

ever necessary and share the information with neighbors and friends. The material in the Information Sheet has subsequently been combined with drawings and published in the form of a 44-page Tree Planter's Handbook. In 1986, an Animator's Field Guide was produced in the form of a 132-page reference book including a series of hand-held flip charts.

3. Research

PADF had not planned to conduct research as a dominant activity since its primary mission was to provide tree extension services to small farmers and community based organizations. PADF is not interested in conducting research for its own sake; rather, its findings must have direct application to the Project so that participating tree planters will be more successful. In general, data are gathered to monitor Project activities so that technical and extension aspects of the Project can be improved. Research began with a series of questions such as who is planting the trees, what are the most important factors in tree survival, is tree planting profitable as a cash crop, are the extension and training programs adequate, etc. To shed light on these questions, PADF research has focused on species trials, village studies, charcoal and wood market surveys, nursery experiments and growth and survival studies. All of the data collection is done by PADF employees. Each of the five team leaders supervises Haitian technicians who collect and sometimes help process the data.

D. Changes in Project Activities

The original concentration of the Project was on fuelwood species with special attention to the charcoal market. Over time, constant feedback from the planter showed that the pole-wood market was perceived by farmers as a prime target and charcoal production was secondary. As a result, the Project has adjusted the mix of tree species provided. Currently, a greater variety of species is available, with a larger component of native species (30%). More effort has also gone into direct seeding of trees as an alternative to high-input nurseries. Pilot programs in living terraces on the contour in the form of Leucaena hedgerows have been introduced by both implementing agencies. Further, local nursery development was not envisioned in the original project design; however, in response to the outreach system, a network of local nurseries now supplies 80% of PADF seedlings. Unfortunately, CARE's community nursery system provides less than ten percent of the total seedlings distributed. In addition, the minimum number of trees per farmer has been lowered from the original 500 trees per peasant toward fewer trees and more farmers. At the present time, half of the participating farmer are planting 150 trees per season and the remainder no more than 250 trees per farmer. Another change, particularly by CARE, was to start an agricultural component to complement tree-planting activities. The AOP has often been critized for calling itself an "agroforestry" project when its focus was only on tree planting activities. With this new component it might render its name more justice.

E. Accomplishments

Success and failure of a project is best assessed when the Project ends and outside support is cut off. One of the best indicators of success is if farmers continue to replant trees after the first harvest of fast-growing trees. Next, are farmers willing to buy the seedlings at the full cost from the local nursery? Are the nurseries operated in a sustaining way? And, last, have the farmers changed their attitudes toward trees which will buttress behavioral changes in the local agrarian economy? One indicator of success is if peasants spontaneously adopt tree-planting activities, copying them maybe from a neighbor.

The AOP is often cited as an extraordinary success story. Here are some of the achievements which back up this credit rarely given to past reforestation activities in Haiti:

1. Diffusion of new tree planting ideologies and practices (i.e., small farm forestry as a production system integrated into peasant agriculture, tree cropping for consumption and sale, living terraces for soil conservation),

2. Expansion of the scale of tree seedling production in Haiti to about 15 million trees per year,

3. Broadening of species selection available to Haitian farmers,

4. Transfer of new nursery technology (small container system),

5. Generation of funds from outside donors or clients directly to nurseries and for the pupose of outreach,

6. Transfer of funds to nurseries via a small margin of profit which serves as a motivational strategy, a tool for efficient nursery management, and generation of funds from tree promotion by PVOs,

7. Capital development of new nurseries with infrastructures such as water systems, shadehouses, warehouses, seed orchards, etc.,

8. Training of hundreds of nurserymen and extension agents, and thousands of peasant farmers, therefore a significant investment in human resources,

9. Development of training materials and audiovisual aids in the Creole language,

10. Demonstration to large donors that viable implementation models exist to serve small community based PVOs in remote areas and

11. Institutional strengthening of at least 42 local PVOs in fund raising and other management skills.

However, labelling the AOP case a "success" does not mean the best possible techniques or strategies were employed or that all problems have been solved for the rural Haitian peasant. Success is being defined here in a very specific sense:

1. **Behavior changes:** Have the concepts and practices of agroforestry become deeply embedded in the repertoire of local cultivators as a normal practice which fathers now teach their children?

2. **Participation and equity issues:** Which segment of society plants trees? Has local involvement in project decision-making occured?

3. **Sustainability issues:** What dependence on outside inputs persists? Will the project continue after the funding ends? Does the project effectively combat soil erosion while at the same time increase the farmers income? Will there be a continuation of benefit flows to rural people without the programs or organizations that stimulated those benefits in the first place?

4. **Tree growth and survival:** Does the project have a good tree growth and survival rate?

Taking these indicators as our criteria of success, the AOP presents a multi-dimensional partial success story. Each of these issues will be discussed in the following chapters, except for the quantitative indicators on tree growth and survival. Let us briefly list the specific quantitative achievements of CARE and PADF.

Through 1987, both CARE and PADF have been successful in achieving their targets set for seedling production, number of participating farmers, sub-grantees and nursery establishments as stated in the original project proposal. In fact, all have been met way in excess of their objectives.

With the completion of an 15-month extension period (through December 1986), the Project has been operating for ten successive planting seasons since 1982. In this time, it has distributed nearly 20 million trees to 87,245 peasant tree planters (including multiple-season, "repeat" participants) registered in its PVO sponsered subprojects. In addition, nursery technologies have been transfered to 30 PVO-operated nurseries and their production capacity has grown to five million trees per year (see Appendix 9).

On January 1987, CARE's outreach network had reached 27,360 farm families in the Northwest province with training and tree seedlings to improve their farming system. CARE's total seedling production (through December 86) is about 6.5 million and current annual production is 1.5 million. Seedling survival after 12 months is 63.5%. At present, 86 local community members are on CARE's payroll which might have positive effects on the local economy. These people have learned many skills besides tree planting and management techniques whch are an asset to their communities (i.e., organizing time, accounting and reporting) for future development activities.

Through PADF, 172 different PVO's and local groups have undertaken a total of 535 (seasonal) sub-projects. Seedling survival is about 50% (after 12 month).

F. Major Problems

Information System: There is a lack of institutional memory in the AOP. When PVOs, field workers, agronomists, technical experts and managers leave, so will the information contained in their heads. However, under the new extension amendment, an Agroforestry Information Clearing House and Outreach Center is planned in order to retain some of this information and make it available to the GOH, other PVO's, international agencies and future AID personel.

Poor record-keeping (and loss of the CARE records), misinterpretation and lack of basic information were found throughout the grantees. For example, few of the field personnel knew where the germplasm of most of the trees originated. Thus, if the germplasm is not good and the source is unknown, the same mistakes can be repeated. Likewise, if the germplasm is good, there is little possibility that more of the same can be obtained.

Technical Problems: The survival rate was initially low, often due to low quality of germplasm. This rate is rising slowly now, but is still below its potential. There is also a greater demand for trees from Haitian farmers than the ACP can deliver. In fact, the numbers of trees delivered has been reduced because of lack of funds. Destruction of trees still occurs from interference with the local livestock economy.

Soil tests for pH, macro- and micro-nutrients cannot be made in Haiti often resulting in bad advice to farmers on species adapted to their microenvironment.

Research Problems: The grantees designed a research agenda pertinent to their needs. With the addition of the UMO research component in 1985, the problem of fitting an officially-designated research unit into an existing research network arose. New topics were added to the pre-existing research agenda and complaints emerged about the inflexibility of the research and lack of responsiveness to grantees' perceived needs. Also, the rapid growth of the Project outreach without an increase in research staff time has overloaded Project personnel. In general, research planning and execution are weak and there is no standardized reporting system.

Extension: No attempt was made to change existing power structure and little was done to build member controlled local organizations to deal with other rural development problems.

Future concerns: The sale value of land might raise significantly after trees have been planted and proven to be profitable. This could cause a problem for sharecroppers who are planning to buy a piece of land which might not be affordable for them anymore. This phenomenon can also cause a problem for many small-holders who do not have a deed for their land.

G. Replicability

Though still unfolding, the AOP experience is of special interest in providing an example and/or model of organizational change by which a large, established, bureaucratic donor institution may be able to redesign its program and structures through a bottom-up, field based learning process.

The experience gained through the AOP implementation approach with its underlying conceptual cornerstones will be most relevant to countries which show similar characteristics as Haiti. These are:

1. Existence and growth of a fuelwood or lumber market such as charcoal and poles,
2. Reliance of large numbers of cash-needy families on income derived from cutting trees to supply this market,
3. A rural economy based on cash-cropping,
4. Weak governmental institutions or no government commitment to carry out tree planting activities and
5. Existence of a large number of local PVOs capable and interested to carry out an agroforestry project.

If local organizations do not exist (as in the Northwest of Haiti), a strong local organization would need to be built or the Project should be channeled through a foreign organization as with CARE.

To sum up, this section described the main differences between CARE's and PADF's Project implementation approaches. CARE established its own central nursery system and carried out all extension and training activities itself. Over the course of the Project, it started to decentralize its nursery system through the establishment of community and more

recently, school nurseries. In contrast, PADF operates its entire program through a network of community based organizations, or so-called PVOs. In order to support these PVO subgrantees, PADF offers grants and technical support services for tree production, distribution and follow-up of fast-growing hardwood seedlings as a peasant field crop.

This chapter also discussed the main differences between the blueprint and learning process approaches and outlined the features of the AOP which show a mixture of both implementation approaches.

CHAPTER FIVE

PARTICIPATION IN THE PROJECT

A. Framework of Analysis

Over the past decade, a consensus has evolved among international development agencies that participation is a necessary condition for meaningful expansion of rural people's ability to manage their affairs, control their environment and enhance their own well-being. The significance of participation in the development process has been emphasized by many development specialists (see Chambers 1986, Gow 1981, Honadle 1979, Uphoff 1985, etc.). They all agree that participation means much more than an occasional meeting in which project staff discuss their plans with local farmers in the usual benefactor-to-beneficiary manner. Participation implies a systematic local autonomy, in which communities discover the possibilities of exercising choice and thereby become capable of managing their own development. This kind of participation has major implications not only for local populations, but for governmental and other personnel involved in the management of development programs as well. Genuine community participation will require new attitudes and behavior among the staff of agencies that deal with the poor. It may also lead to new patterns of distributing power and controlling resources.

If "people's participation" is to be more than a trendy slogan, development planners must face the nuts and bolts of

organizing participation. They need to know the details of who participates, how they can participate and to what extent they could participate in project design, execution, evaluation and monitoring. In this respect, the analysis of these issues in the AOP tries to address practical and methodological issues concerning the integration of popular participation with project planning and implementation.

Since there is no absolute standard for judging participation, I will be using a slightly modified version of the analytical framework developed by the Rural Development Committee at Cornell University (see Figure 8). This framework clarifies the three "dimensions" of participation: Who participates in what kinds of activities? And how does this participation occur[1]? Ideally, if "true" participation is to occur, the project beneficiaries should participate in the decision-making, resource cooperation and management process of each phase of the project cycle. As illustrated in Figure 8, the beneficiary should take initiative to identify the problem and choose solutions in conjunction with the organization willing to sponsor such a project or undertaking. Next, the potential beneficiaries should be included in the planning phase of the project, deciding on the components, inputs and services to be provided by each party. Then, participation of the beneficiary in the implementation phase as well as in reaping the benefits

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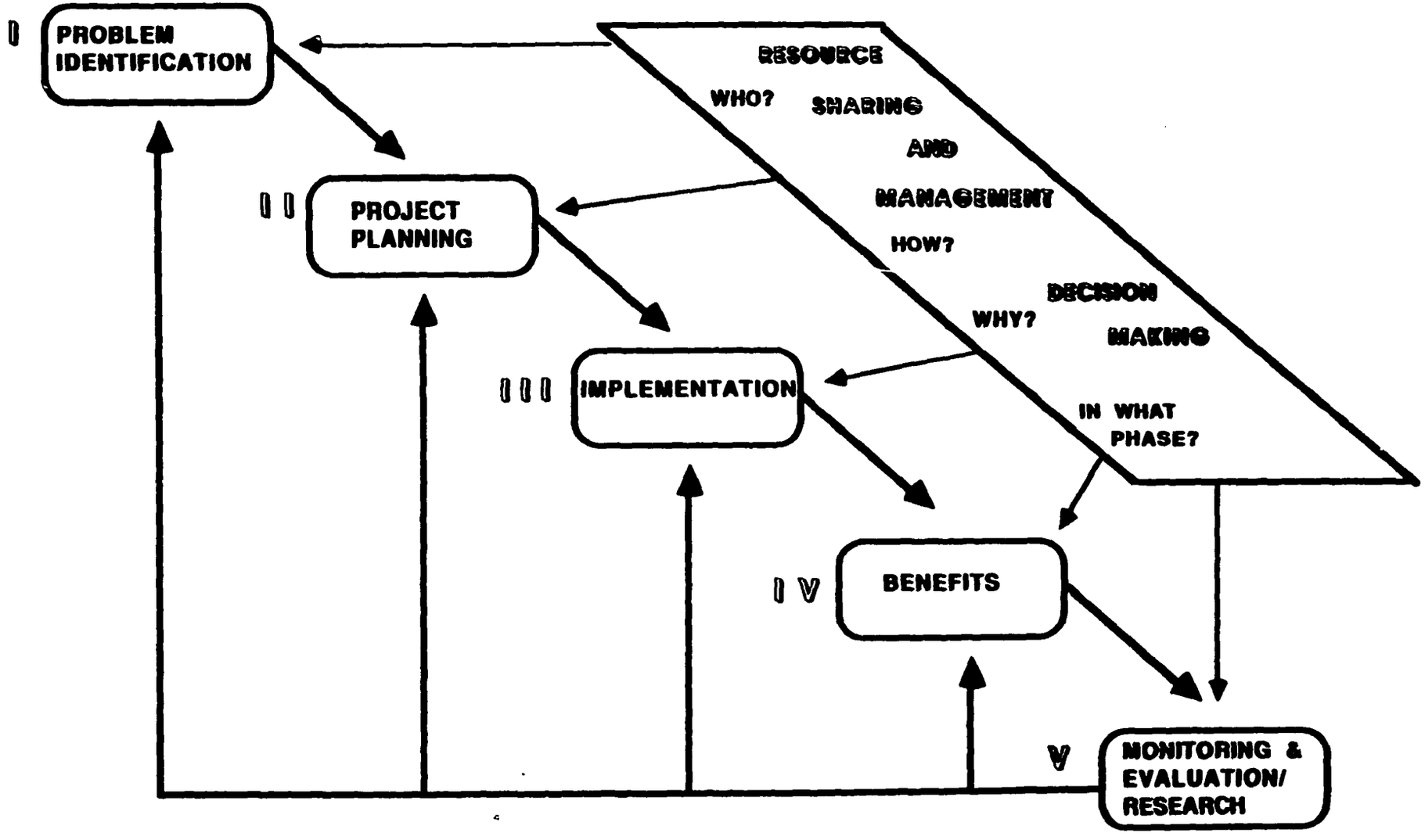
[1] These concepts and issues are elaborated in J. Cohen and N. Uphoff's "Rural Development Participation: Concepts and Measures for Project Design, Implementation and Evaluation", Ithaca, NY, RDC, Cornell University, 1977.

FIGURE 8

LOCAL PARTICIPATION IN THE PROJECT CYCLE



is crucial if a project is trying to become sustainable. Deciding how benefits are distributed among the participants and establishing mechanisms which prevent unequal access to the benefits are important decisions to be made by both parties. Last, the beneficiaries should also be involved in monitoring, evaluation and research activities in order to strengthen their capabilities for self-learning and joint problem-solving.

According to our concept of effective participation in all phases of the project cycle, communities decide what type of development project they want. Then the implementing agencies would help them plan their strategies for acquiring the necessary support to carry out the project. However, if development agencies were to wait for the peasant communities of Haiti to spontaneously prioritize tree planting and other soil conservation techniques, it is unlikely that soil conservation would ever be achieved. The need to undertake a soil conservation project is thus determined outside the community. Thus, the initial tasks of the implementing agency engaged in soil conservation projects differ from a project whose problems and solution have been identified by the community itself. Its strategy is one not of learning what the felt needs of the community are, but of learning what is the most profitable way to introduce a project the community may never have thought of or may in fact initially resist. Given that it is not part of the Haitian peasant economy, tradition or culture to plant trees, should peasants have the final say in

what types of trees to be planted? The large-scale planting of fast-growing wood trees as a cash-crop is a concept that has been unheard of in traditional Haiti.

There exists also the view that local participation is only possible for small projects, but not for large-scale projects which require a more centralized planning approach. The AOP is considered a large-scale tree-planting Project trying to cover the entire country. How is it possible to involve local peasants in this enormous planning task? Let us turn to the AOP to find out what kind of participation occurred and what mechanisms for participation existed. Unfortunately, I lack sufficient data on the local groups and PVOs to determine if they represent the majority of interest groups in the rural areas. For instance, no information has been gathered on the number of landless peasants hired by the Project. Thus, the participation analysis of CARE's and PADF's implementation approaches is limited by the data I was able to gather and the interviews conducted with representatives of both agencies. I will follow the framework illustrated in Figure 8 and analyze <u>who</u> is participating, <u>how</u> are they participating, <u>why</u> and in <u>what</u> phase of the project cycle. Both implementing agencies are treated separately where the difference is important. In addition, suggestions are made how local participation could have been improved in each phase.

<u>1. Problem Identification/ Finding Solutions</u>

Who identified or diagnosed the problem? Who chose a solution? Haiti's environmental problems are well-known by the

international development community which is illustrated by the quantity of past and present soil erosion projects. Gerald Murray and other researchers were charged with the task of designing a new solution to an old problem. Based on Murray's study (1979) of lessons learned from past soil conservation projects and a number of other wood market studies, USAID developed the framework of AOP. The Project design team was composed of USAID project design staff, and contracted Economists, Foresters and an Anthropologist (G. Murray). During this phase, a number of local PVOs were contacted to determine their experience and interest in participating in tree planting activities. The design team tried to assess their institutional capacities to implement such activities. However, the local PVOs were not involved in making suggestions of how the problem could be resolved. Neither did Haitian peasants directly participate in the first phase of the project cycle. At most, they participated indirectly through the interviews conducted by Murray. Thus, Murray can be regarded as an interpreter of farmers' interests.

Suggestions: How could the local peasants play a more active role in this phase of problem identification and choosing solutions? They could be:

1. Consulted in checking the validity of socio-cultural information gathered by outsiders and
2. Provide historical information about earlier possibly similar projects and their interpretation of the reasons for their success or failure.

Also, rapid rural appraisal techniques could be employed to determine quickly what the local populations' priorities are on the most urgent problems, according to the different social groups in the community. Then a village meeting could be organized to explain the linkages between soil erosion and the priority problems identified by the community. After the community understands these linkages, its members can provide ideas on how their problems and soil erosion problems could be solved simultaneously. Thus, this phase constitutes the first step to engage the community in a dialogue with the implementing agency and among the various subgroups within the community. Where a local organizational network already exists, the design team can consult with its members after determining which segment of the communities the various local organizations represent. The goal of this phase is to combine local ideas with new, maybe previously unheard, ideas to generate innovative and creative solutions which benefit most of the various segments of the local population, particularly the most frequently ignored, poorest segments.

2. Project Planning

CARE engaged a forestry consultant in 1981, to provide technical advice in project design and to analyze various programming alternatives. Based on her recommendations, previous lessons from reforestation experience in Haiti and CARE's experience in agroforestry projects in other parts of the world, the details of the Project were designed and

planned. To my knowledge, no farmers were consulted to provide advice on the major decisons to be made by the Project such as centralized versus decentralized nurseries; location, size and management system of nurseries; seedling distribution system; species selection; recommended planting configurations and type of extension, training and information system to be developed; and indicators to measure project success. It was in this phase that decisions were made by CARE staff that Project participants had to plant a minimum of 500 trees and that these had to be planted on his/her own land. These planning activities were undertaken in conjunction with HACHO, a local quasi-governmental organization which was also to be involved in the implementation phase of the Project. Thus, HACHO's previous experience with tree planting activities was incorporated in this planning phase.

Fortunately, CARE's project design and planning strategy was based on learning and capacity building and thus contained a redesign orientation. Feedback mechanisms to check the Project's underlying assumptions were built into the design, e.g., periodic revisions of Project organization and objectives through field visits, reporting system and interaction with peasants.

PADF relegated some of the project planning tasks to its subgrantees. The individual PVOs had to work out the details of their implementation plans and administrative structure. However, potential beneficiaries who were not included in the membership of these PVOs had no say in this phase. Which PVOs

could participate in the AOP? Any PVO could qualify which demonstrated its capacity to provide its own resources to carry out the activities agreed upon with PADF. To sum up, in this phase, local PVOs had some flexibility to design their own implementation plan albeit they were limited by the active role played by PADF in defining their activities in terms of number of seedlings to be distributed and number of farmers to be reached. They also had to supply PADF with information collected through the extension system. Overall, peasants' experience and ideas were not included in this phase.

Suggestions: The local peasants could have been included in this planning phase, particularly regarding some technical decisions. It goes without saying that technologies developed in close collaboration with the intended users will have a greater likelihood of adoption than those handed down from high. The formation of a local advisory group representing the various segments of the community or simple village meetings could have provided valuable inputs in this phase. Decisions on the minimum number of seedlings to be distributed could have been made together with the beneficiaries, and issues of land and tree tenure could have been discussed in such meetings.

3. Implementation

CARE implemented the Project directly by hiring expatriates and local staff. Initially, all the key positions were occupied by foreigners, but in AOP II, some of these positions

were gradually "turned over" to Haitian counterparts. As of 1987, at least four key personnel were still expatriates with no plans to replace them with Haitians. CARE selected local people as nursery workers, animators and farmer monitors. CARE preferred to hire animators and monitors who are literate and occupy some leadership position within the community. Thus, given Haiti's low literacy rate, it is very unlikely that landless or the poorest farmers were selected for these positions. Were women involved in this implementation phase? One of CARE's four operational regions was headed by a women Forester until the end of AOP I. Nearly one half of the people who work in the community nurseries are women. However, thus far, the Project has been weak in its use of women in extension positions. Prior to 1984, no women were involved in the extension teams and since then, all but two women are employed as Monitors and none as Animators. As CARE moved toward its decentralized nursery system, two women's groups were established in two areas of the Northwest to manage their own community nursery. The primary motivator to establish these women groups was a female Peace Corps Volunteer who has not been replaced by a Haitian women yet.

Community meetings and farmer group meetings are other ways for peasants to participate in this phase of the project cycle. However, these are mainly motivational and educational in character and do not provide a forum to exchange ideas in order to change the implementation strategy. The participating farmers are the other main implementators of the Project,

besides the extension agents. They control the Project in two principlal ways: 1) Species selection and 2) agroforestry configurations. Even though extension agents inform farmers of the benefits of exotic species and a variety of agroforestry spacing and tree/ crop combinations, it is the farmer who makes the final decision on what and how to plant. Initially, both CARE and PADF emphasized fast-growing exotic species. But in response to local demand, they quickly included several local species which now comprise a third of the trees planted.

PADF: The subgrantees, their extension network and the planters, are the main participants in this phase of PADF work. About two-thirds of the subgrantees are affiliated with churches, and the rest are groupman and other development PVOs. These PVOs hire local Animators according to their own selection criteria, but PADF recommends that those are literate and occupy leadership positions if possible. Several research reports have shown that various of the Animators hired work through their affiliated churches or membership groups and therefore did not serve the needs of all the potential project participants in the community (Balzano 1986). This pattern is reinforced when Animators are paid on the basis of the number of participants they recruit. Nearly all the members of the groupmans are men. Thus, no female planters are reached if the Animators work through their organizations.

The Animator is trained in his/her activities and does not have any flexibility to change the extension procedures.

If he/she fails to comply with the norms established, he/she is removed from the payroll.

Participation of the farmers occurs in the same way as in CARE. The planter not only decides on the type of tree and planting configuration, but also contributes his/her own land and labor. Some type of resource commitment has often been cited as a necessary element in project success (Gow 1981, Morss 1976).

Suggestions: A better two-way information flow could have been established between implementers and beneficiaries. For instance, criteria for evaluating the performance could be agreed on between both parties. Opportunities for frequent Project review between both parties could have produced suggestions on how to make the Project more responsive to local needs. Also, an effort could have been made to build local leadership in techniques of influencing change, making informed decisions, attracting and managing resources to achieve the objectives, and how to phase in local organizational responsibilities. Further, the Project could have experimented with different participatory management styles. For example, local committees or working groups (representing the various segments of the community) could have been established to cooperate with the implementing agency in carrying out the aggreed upon activities. Then, regular community meetings could be held where the rest of the villagers participate, aided by training that enables them to understand the proceedings and records of the committees.

4. Benefits

Who has benefitted from the Project? Who is the typical tree planter? Did the Project address the needs of the landless or near-landless? Did women participate in the benefits? What methods did AOP apply to ensure equitable distribution of Project benefits? Why did peasants participate? This Section will not distinguish between CARE and PADF except where specifically mentioned since socio-economic research concentrated mainly on the larger PADF implementation agency.

The only check which the AOP provided to ensure equal benefits, was the limitation on seedling distribution which was initially set at 500 seedlings and then gradually reduced to 250. These limits were too high at the begining of the Project for the smaller landholders to participate. Farmers with bigger landholdings could come back to get additional seedlings the following year. In some cases, some farmers signed up for trees with different Animators to overcome this tree seedling limit. Thus, the Project did not prevent the benefits from accruing to the better-off. This is reflected in the findings of several planter-profile studies (see Balzano 1986, Buffum 1985, Conway 1986) which indicated that participants have larger landholdings, are mostly male, and are more literate and own more animals than non-participants. Many small farmers can only afford to plant a few trees, and possibly for this reason they are sometimes overlooked as appropriate AOP participants by the Animators and Monitors. Animators may also overlook certain peasants, especially the

poorest and female ones, due to their misinterpretation of the tenancy rules for AOP participation which state that trees should be planted on securely-held land. This can be interpreted at the animation level as trees should be planted on "bought land" (which has a deed). Despite this, peasants have been found to plant AOP trees on inherited family land with nearly the same frequency as they plant on land they have purchased. Yet the rule may be excluding some sectors from either registering for AOP or being recruited by Animators/ Monitors as participants. Having only very few female extensionist might have further contributed to the low female participation in tree planting.

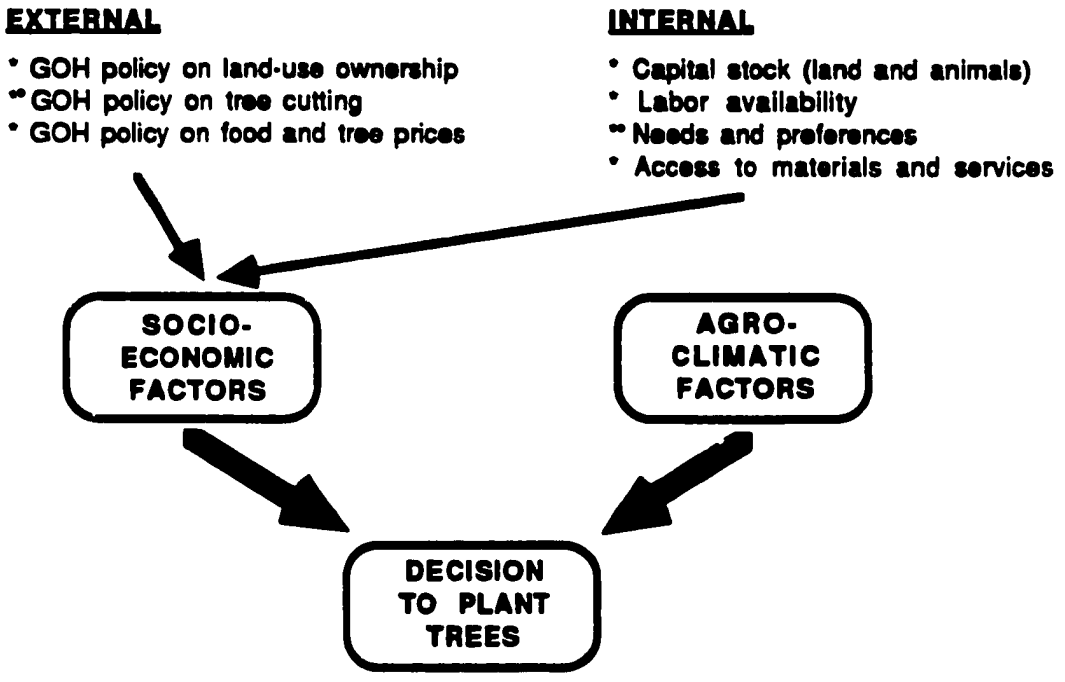
The original Project proposal proposed to lease land from the GOH in order to give landless farmers the opportunity to participate in the Project's benefits. This component was never implemented, however, mainly due to administrative obstacles, as one report explained. Thus, landless farmers (which fortunately comprise only a small percentage of Haitian rural society) and very small landholders were excluded from the Project.

Motivation/ Farmers' Decision-Making Framework

The AOP assumed that the planter's main motivation to participate was the prospect of cash-income in the relative short-term (four to five years after tree planting). However, planters use a much more complex framework of decision making as illustrated in Figure 9.

FIGURE 9

FARMERS' DECISION-MAKING FRAMEWORK



The project planner has to ask him-/herself how external factors affecting farmers' decisions about adoption can be most effectively manipulated to maximize the net social benefit of their internal decision-making. Adoption depends also on:

1. The felt need by the intended participants for and the immediacy of the alleged agroforestry benefits,
2. The extent to which related practices are already familiar and in effect,
3. The level of material and educational inputs necessary and available to the target areas from outside and
4. The level of risk acceptable to those who must adopt the changes.

Why have AOP participants decided to plant trees? Interviews by Balzano (1986) and Conway (1986) have indicated that farmers generally plant and maintain trees because they perceive them to have economic benefits which can be realized in increased income. These assumptions will only be tested when trees currently being cultivated are harvested, and planters make decisions about whether to allow the stumps to resprout, to replant seedlings or to discontinue tree cropping.

Observation of tree harvesting activities by the 1982 planters has shown so far that many planters use their trees as a form of savings, harvesting them when the need for cash arises rather than according to a silvicultural rotation schedule. The logic of the harvest appears to be based on needs for cash or wood rather than on a complete rotation of the tree crop. Many planters interviewed valued their trees for their potential multiple uses rather than for a single product which could be sold. Cultivating such trees is one of the few opportunities many rural Haitians have for accumulating assets, particularly after the African swine fever epidemic destroyed all pigs which served such an asset function. Trees have also been found by other researchers to be poor people's assets (Chambers 1987b). Field research has also shown, that there is probably more non-monetary interest in AOP trees than have been assumed by the Project designers. These are:

1. **Reducing Uncertainty:** Trees diversify farm production and once mature, can resist drought and can be harvested at any

time. Mature trees are neither dependent on the seasonal cycle nor as vulnerable to the vagaries of climate as annual crops generally are.

2. **Domestic Consumption:** Many planters interviewed were concerned about their ability to provide housing for themselves and their children. Others needed fuelwood for their small business such as potteries and bakeries.

3. **Soil Improvement:** Some AOP participants planted seedlings in anticipation that their trees would help to increase crop production by reducing soil erosion, both because their roots would retain soil and because they would divert water run-off and catch organic matter being washed down a slope. This interest was also proven by the initial positive response of planters to adopt hedgerow planting recommendations.

4. **Labor as a Constraint to Agricultural Production:** Eighty-one percent of a random sample of planters interviewed in 1985 employed agricultural labor (Grosenick n.d.). Hired labor is needed by poorer farmers as well as wealthier ones for crop production and many farmers said that the lack of cash to hire labor for land preparation and weeding was a major problem. Tree cropping requires less labor and can help poor farmers to use their marginal land more appropriately without increasing their production costs to the same degree as annual cropping. However, on the other hand, some landlords have converted sharecropped land into woodlots and have displaced several sharecroppers. This displacement of labor might become a problem in the AOP.

Suggestions: The question of tenancy should be placed in the hands of the individual peasants who are in the best position to make such a determination. Special arrangements between owners and sharecroppers or renters could be encouraged by the implementing agencies which guarantes the planter ownership of the trees planted or a sufficient share in the benefits of tree-planting to motivate him/her to plant and care for the trees. Further, strategies have to be found to target particularly the landless and very small landholding peasant. They could be given hiring priority in the nurseries or assisted in obtaining land leases from the GOH or absentee landlords. Other incentive schemes targeted toward the poorer segments of rural classes are mentioned in Chapter VII.

5. Monitoring/Evaluation and Research

Participation in evaluation, if planned and controlled by outsiders and intended basically to meet outsiders' requirements, does not qualify as meaningful "participatory evaluation." The main function of the evaluation process should be to strenghen local capabilities for self-learning and joint problem-solving of the participants as a group (Huizer 1983). Evaluation can be divided into two areas:

1. Ex Post evaluations are undertaken by short-term consultants to verify whether the project is accomplishing its intended objectives. The main purpose is to satisfy donor agencies' requirements to receive information on the project's success. The emphasis is usually on results.

2. On Going evaluations are a process undertaken by groups and organizations involved in planning and implementing the project in collaboration with the intended beneficiaries/ participants. The purpose is to strengthen the local capabilities for self-learning and joint problem-solving. The emphasis is on the process for what is learned and concluded by the participants. The process should be self-managed, introduced and guided by the organizers, but handled by the farmers themselves.

The criteria for evaluation ideally are to be selected and agreed by project participants. Motivating farmers to develop their own evaluation methodology could help to institutionalize self-critical feedback as a normal procedure of their activities. Such periodic meetings also facilitate communication within the group. New ideas are exchanged, information shared and leadership questions can be addressed. The functions of such self-evaluating meetings include to:

1. Agree on objectives of the organization/group or project,
2. Identify shortcomings in performance,
3. Build group solidarity by facilitating communication within the group and
4. Determine priorities for improvement in order to reach consensus on priorities for action (i.e., relevant training activities can be identified).

Thus, training activities of the Project have to be tailored to the needs identified by the group. The Project extensionists could devise relevant training activities in consultation with farmer representatives. Was there occuring any systematic, interactive process along these lines in the AOP ?

CARE: Monitoring of field activities is mainly done by the Project staff through the use of questionnaires, farmer group meetings and field visits. The questionnaires provide mainly technical information on species selection, survival and growth. The Monitors and Animators are only responsible to collect these data and fill out the questionnaires. It is the senior staff (Haitian Agronomists) who assess continually the effectiveness of the farmer training efforts through regular site visits (see Chapter IV., Section B.3). The Regional Forester then compares these achievements with the intermediate goals set by CARE utilizing the indicators predetermined by the Project designers. In-house evaluations are conducted four times a year and the lessons learned serve as the basis to plan the next quarter's activities. An ex post evaluation at the end of AOP I was conducted by several expatriate short-term consultants and will be repeated at the end of AOP II.

All of CARE's limited research is carried out by senior staff and tree planters only participate in providing information requested by the interviewer or lending their plots for trial studies. Thus, no formal mechanisms were established which permitted the development of a more participatory evaluation process which included tree planters. At most, through field visits and planter group meetings before and after planting, information was exchanged in both directions, but rather informally.

PADF: All of the research is performed by PADF staff and none is done by Animators or tree planters. Initially, a

series of questionnaires was developed for use by the Animators in their contact with all tree planters. The purpose of these forms was to supply the Project with sufficient data for its research needs and to structure the activities of the field extension agents. However, after two planting seasons, the information system was cumbersome, and the value of the data collected was questionable. The Animators were trained in questionnaire procedures, but their level of literacy, interest, available time and competence varied considerably and the data gathered could not be used to answer research questions (even with revisions and shorter forms). Thus, in 1984, PADF reoriented the planter questionnaire system and it is now used strictly as a tool for extension rather than for data gathering. The new system developed for data collection is entirely handled by PADF employees as described in Chapter IV., Section C. This research serves mainly to monitor the Project activities and was not based on the principles of participatory action research.

Suggestions: Beneficiaries should assess growth and other measures since they will be the end-users of the trees. Technical improvements should only be made upon specific requests by farmers and should not be imposed by outside evaluators. The field extensionists could have been trained to engage villagers in gathering and interpreting data on their own villages and land plots as a consciousness-raising experience. Such self-evaluation could be part of an annual meeting, maybe in conjunction with a festivity (which might include serving food) or a religious event.

Further, this self-evaluation approach can be utilized to identify groups which had been particularly successful in establishing a community-nursery or mobilizing farmers to participate in the Project. These more successful groups could be hired or invited to plan and provide training for the less successful ones. CARE's and PADF's approach so far has been to drop the less successful subprojects. Maybe AOP could learn from some of the experiences gained in engaging farmers in agroforestry research elsewhere (see Chavangi 1987 and Rocheleau 1985, 1987).

To summarize, the role envisioned for the small landholder was passive rather than active. They only participated in the decisions regarding their own resource allocation. They received the benefit of free tree seedling and free education/training in the field of tree management. However, the problem of unequal distribution of benefits has not been resolved yet, and no strategy has been devised to address the issue of the landless farmers.

One possible reason why the AOP was formulated with little involvement by the Project beneficiaries can be found in the unwillingness of Project staff to include beneficiaries in Project activities because of time constraints and overriding pressures from USAID to achieve specific output targets. The two implementing agencies were under pressure to meet those output targets in order to be candidates for a Project extension grant. Further, in-house evaluation reports

indicated that all agroforestry field staff were overworked. Given the financial resources, the amount of area covered, and requirements for strict adherence to schedules, staff did not have sufficient time to devote full attention to all aspects of the Project. None of these circumstances are conducive to include more peasant participation in Project activities since it is even more staff- intensive and time-consuming.

Participation must be self-perpetuating, not dependent on visits by outsiders. To sustain participation in the long run, the AOP should explore ways to help build more stable social-organizational structures within the peasant communities.

CHAPTER SIX

SUSTAINABILITY OF THE PROJECT

A. Framework of Analysis

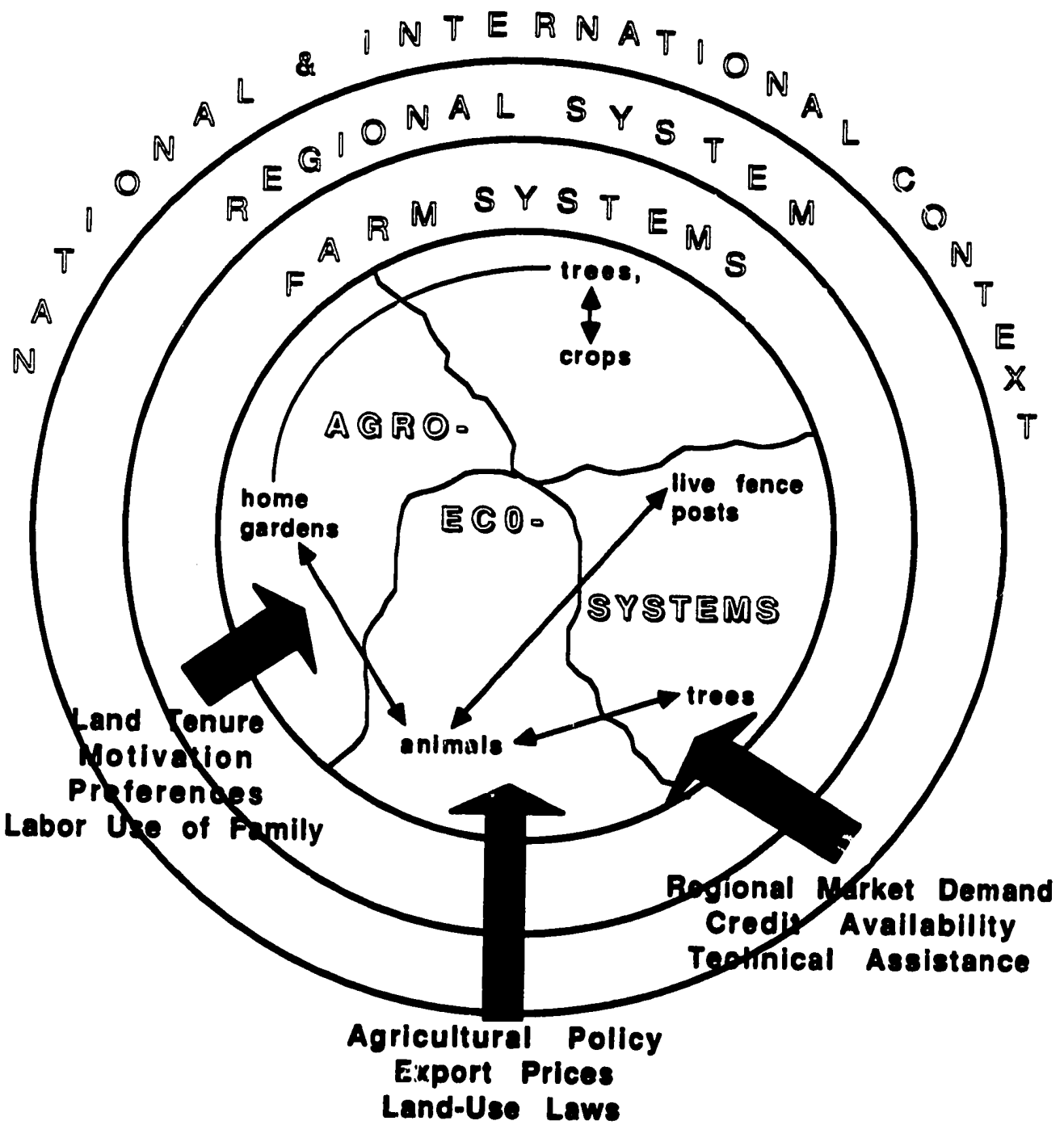
What is sustainability? How is it achieved? Whose sustainability are we concerned with? In order to define sustainability, it is useful to conceptualize agroforestry as involving systems instead of projects. This allows one to view the project environment as a unified system with various environmental and human subsystem working and interacting at different levels producing inputs and outputs relating to the overall operation of the system. Within this system, there are multiple levels of sustainability and we know - according to systems analysis - that the sustainability of the entire system is limited by the least sustainable level. There are three levels of concern to most agro- and social forestry projects (Kramer 1987) - the farm, community and the region (watershed). The farm (household) is the foundation and focus of most agroforestry development projects (as is also the case with the AOP). However, farmers depend directly on the second level, the community for certain resources and services. The community level refers to the surrounding natural environment of the farm and includes the systems that support them all. This level exerts, depending on how it is managed, a drain or a boost to the sustainability of the farm as well as the region, the third level. "Region" in this case refers to a

large group of communities that may act in a coordinated fashion to allocate goods and services and their labor. We could add more levels which are all interdependent as represented in Figure 10, but for the purpose of this analysis, I would like to concentrate on the farm and local level's sustainability since these are the levels where external inputs are channeled. Although the farm can be regarded as the foundation of sustainability for the system, the surrounding locality and the people that reside there are the practical vehicles for development assistance to reach the farmer. The structure of communities and the social rules that bind them together influence in subtle, but strong, ways the potential for a successful project. The most important factor for the sustainability of a community is its ability to make its own decisons, manage its own resources and lead its own development.

External assistance is usually given to projects for only a few years (Honadle 1979). As mentioned previously in Chapter IV., Section E, one important (if not the most important) measure of a project's success, however, is what benefits continue after outside support ends. Thus, the notion of sustainability as a self-driving condition in which benefit flows are maintained and enhanced long after the original external resources have been exhausted is a key aspect of the concept of development. Without this dimension, development simply promises continual dependence.

FIGURE 10

Hierarchy of Agroforestry Systems



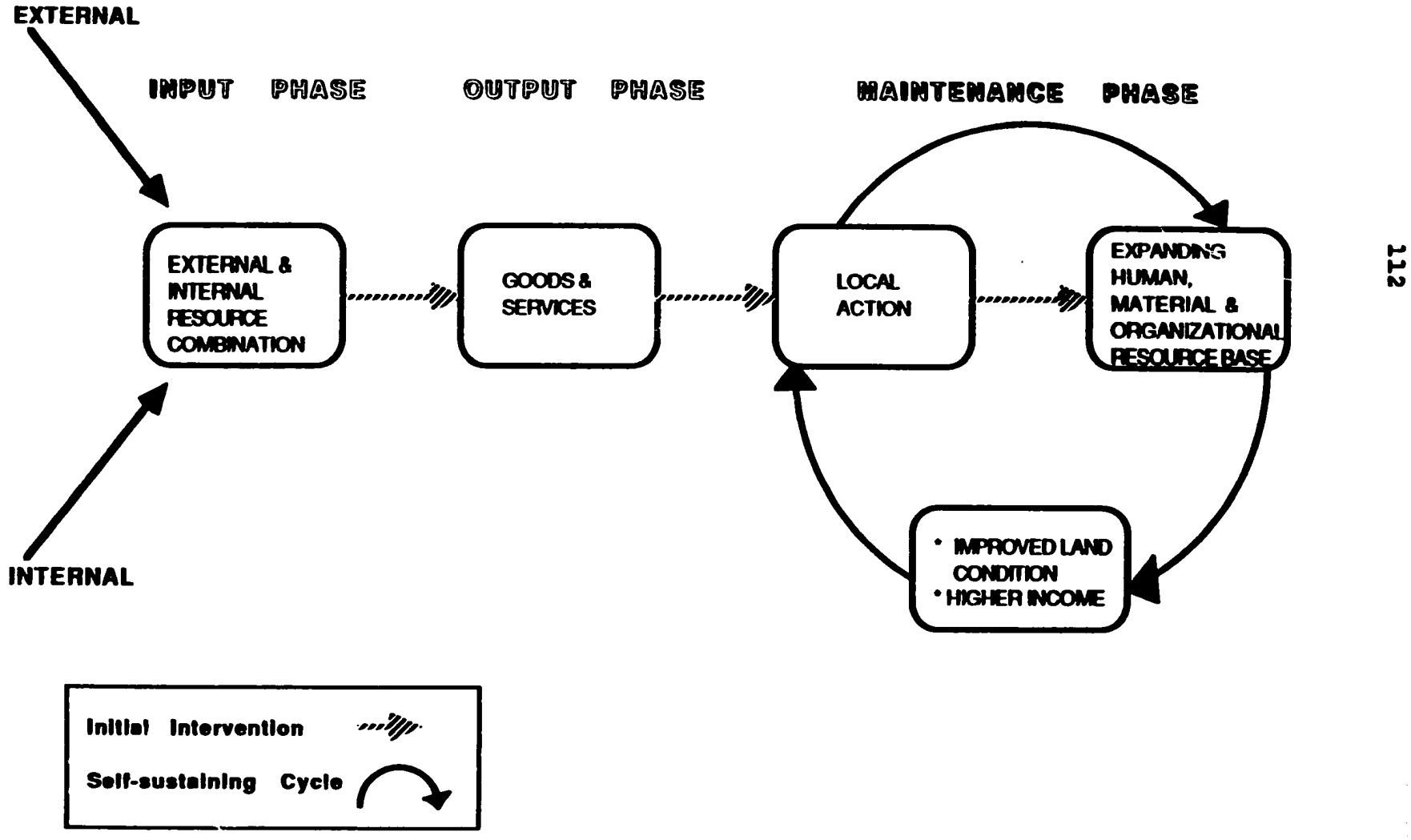
For the purpose of assessment, the degree of sustainability may be considered as the percentage of project-initiated goods and services that is still delivered and maintained five years past the termination of donor resource inputs, the continuation of local action stimulated by the project and the generation of successor services and initiatives as a result of project-built local capacity. Ideally, this assessment would include a visit to the project site five to ten years after its termination.

When the expatriate funding for the project has completed, who will carry on? Easily we say our counterpart will. In reality, the number of projects continued by counterparts in the absence of donor funds is very small. When community management of the project's activities is promoted and nurtured at the local level, the benefits have at least a chance of being sustained.

Achieving self-sustaining development, therefore, requires a focus on post-project performance. This focus is depicted in Figure 11. In this diagram, the project is shown as the application of resources to produce a set of goods and services that local populations use. This should lead to increased income and improved well-being among farmers and an expanded organizational capacity to continue to offer relevant services. The central focus, however, should not be to deliver project services. Instead, it should be on how these services will be delivered after outside assistance ends. In this context, every planning and implementation decision should be

FIGURE 11

PROMOTING SUSTAINABLE RESOURCE-USE MANAGEMENT



made in the light of the sustainability issue. An emphasis on immediate production goals such as number of seedlings produced, leads to project designs, organizational choices, and management practices that block the transition from the input/output phase to the maintenance phase. Let us return to our AOP case study. How would this model apply to the AOP in its idealized version? In its input phase, external and internal resources are combined. External resources include nursery technology (e.g., rootrainer, potting mix), exotic species, expatriate knowledge and money. Internal resources include local knowledge, local resources (e.g., land, labor) and local currency. Joint decisions are made between the foreign donor and local beneficiary to produce new goods and services in the output phase such as seedlings, nurseries, demonstration plots, trained personnel, action-research and farmer-to-farmer extension services. In this process of developing these goods and services, the local people participate in their own development and have the opportunity to strengthen their capabilities and build their own channels for expression and accountability. This results in a change in behavior and commitment of resources to support those initiatives by the people who became participants in this process. The next challenge is the transition from the initial intervention to the self-sustaining cycle or the maintenance phase. The goal in this phase is a breakthrough into a self-sustained microeconomy of tree cropping. In order to sustain local action, some form of organizational structure is needed. A common project strategy is

to coopt or create a beneficiary-oriented organization. Local organizations can facilitate collective action by helping people make decisions or reach consensus and by providing a communication link with supervising agencies and project personnel. Often local organizations are valuable as channels of information about needs for specific services. Moreover, because they may be primary users of these services, local organizations have an important role in planning and implementing service deliveries such as tree seedlings and farmer training in tree management; and as vehicles for distributing benefits, they can support project equity objectives. Thus, the purposes of a beneficiary organization are to enhance participation by providing beneficiaries a mechanism that they consider to be their own, and to support sustainability by creating a local entity that can continue appropriate project functions after the project ends.

Viable local organizations are a necessary, although not in themselves sufficient, condition for maintaining local action. Often an incentive structure is needed to facilitate beneficiary response. This may be based on the assumption that the project addresses a basic need (such as increased income) among the beneficiaries and may itself be an adequate stimulus to encourage them to respond. Other approaches are providing subsidized inputs or increased security of land tenure which require supportive policies or they can not be implemented. Other innovative incentive schemes are mentioned in Chapter VII. Let us now examine the various sustainability components

in the AOP, particularly with respect to the post-project dynamics or maintenance phase as diagramed in Figure 11. At the end of this chapter, the author tries to differentiate between CARE's and PADF's performance when data were available and/or the differences are important in terms of long-term sustainability.

1. Economic Sustainabilty

Self-sustainability in this Section refers to the economic viability of agroforestry, specifically its ability to continue without a subsidy. Perfectly self-sustained tree cropping would be financed by capital derived from previous tree cropping. Perfectly self-sustained organizations would promote tree cropping with returns from tree cropping.

The most important assumption in the design of the AOP was that agroforestry in Haiti would be a viable economic activity at the small-farm level. In 1986, Grosenick (1986a) tested this assumption by conducting a cost/benefit analysis of farm-level agroforestry associations in the Project. His analysis demonstrated that 85% of the AOP plantings would have a higher net present value (profit) when compared with continued production of agricultural crops alone. The model was based on a sixteen-year cycle of four rotations. Each rotation lasted four years, with intercropped agricultural species harvested during the first two years and the trees harvested at the end of the fourth year. The model assumed that erosion from continued agricultural cropping without trees would

reduce crop productivity by two percent per year. An example of the calculations for one such association is given in Table 3.

This model has several limitations. For instance, no discount rate is used in the calculations, and livestock production was not included in the model for lack of data. It also assumed that the value of wood increases each cropping cycle even though research has shown that the quality of wood decreases after several cycles of recoppicing. In addition, a four-year cycle is too optimistic given the severity of degraded lands where the trees are planted. It is also unrealistic for poor farmers to wait four years to receive any benefit from the trees, even though some income is earned during the first two years from agricultural production. Nevertheless, this model together with fuelwood and polewood market studies (Ehrlich 1986, Grosenick 1986b) indicate that profitable possibilities exist to absorb the wood produced through the Project. Interviews with tree planters also indicated that they perceive farm forestry as profitable. However, this perception is based on a subsidized activity. Most seedlings are free and are usually delivered to a point near the planting site. Technical assistance and follow-up are also provided free of charge.

Some steps have been taken toward reducing subsidies to AOP planters. Elimination of the incentive payments was an important advance, especially given the history of payments for tree planting in Haiti. Recently, fruit tree seedlings for

TABLE 3

NET BENEFIT FROM AN AOP AGROFORESTRY ASSOCIATION:

SOUTHERN REGION: MAIZE, SORGHUM, CONGO BEAN (US $)

Year	1	2	3	4	5	6	7	8
Benefits of crops without trees (forgone production)	-25.59	-25.08	-24.57	-24.08	-23.60	-23.13	-22.67	-22.21
Crops with trees:								
Net revenues from crops	25.59	25.08			26.11	26.11		
Planting costs	-2.85							
Net revenues from wood				54.39				63.62
Net benefits	-2.85	00.00	-24.57	30.31	2.51	2	[illegible]	41.41

Year	9	10	11	12	13	14	15	16
Benefits of crops without trees (forgone production)	-21.77	-21.33	-20.91	-20.49	-20.08	-19.68	-19.28	-18.9
Crops with trees:								
Net revenues from crops	26.11	26.11			26.11	26.11		
Planting costs								
Net revenues from wood				74.43				87.0
Net benefits	4.34	4.78	-20.91	53.94	6.03	6.43	-19.28	68.1

Source: Grosenick 1986a

sale (still at a subsidized price) in Project-supported nurseries were introduced which can be seen as another step toward at least a nominal fee for all seedlings.

The ability of most peasants to pay for any farm inputs, however, is severely limited. A recent evaluation of the AOP recognized that since wood harvesting has only recently begun, it is still too early for planters to be willing to pay even a

nominal price for Project seedlings (USAID/Haiti 1986). Nevertheless, the evaluation recommended that PADF and CARE begin introducing cash payments for seedlings on a pilot scale before the end of the second phase of the Project.

Landholders currently planting seedlings through the Project obviously vary in their ability to make such investments. If all subsidies were removed, even those for technical assistance, the number of peasants able to practice tree cropping would be sharply reduced. This raises two issues: equity and environmental impact. If only wealthier peasants have access to seedlings and crop them successfully, then disparities in rural income will increase even more. In addition, disparities in the value of land and access to land improvement will increase, leaving poorer peasants even more marginal. Furthermore, from the point of view of environmental restoration, it is desirable to include as many landholders as possible, both to cover a wider area with trees and to provide the largest percentage of the population with an alternative to cutting natural stands of trees. Thus, the potential environmental impact of the AOP would be greatly reduced if only the richer landowner participate in tree planting activities.

2. Environmental Sustainability

The environmental impact of the AOP is much more difficult to measure than its economic benefits since its potential can only be perceived in the long-term future. Nevertheless, the integration of trees as perennial crops on farms can

be expected to have a number of beneficial effects on the environment, both directly and indirectly. Among the direct effects are reduction of soil loss on slopes, retention of rainwater in the soil, creation of microenvironments with reduced evapotranspiration, increase of organic matter and (with some tree species) fixation of nitrogen in the soil.

Tree cultivation is often being cited as an appropriate land use for steep and eroded sites. However, this is still a debated issue among soil scientists, since hardly any data exist which proves this assumption (Sanchez 1987). USAID/Haiti estimated in 1986 that 40% of the trees planted through PADF and CARE are on slopes of 20% or more (USAID 1986). But, no quantitative data about planting on marginal sites are available in order to measure the potential effects on restoring certain soil properties.

Indirect protection of the environment is expected as well. It is assumed that wood from Project farms will replace wood cut from natural stands. Wood produced from seedlings already planted through the AOP betweeen 1982 and 1987 is projected to satisfy two percent of national wood demand in the 1990's (Grosenick 1986a).

Environmental impact and sustainability could be measured in terms of reduced siltation problems in irrigation systems, increased agricultural production due to a reduction of soil loss and increase in organic matter and nitrogen fixation in the soil. More research on these subject is proposed in AOP II.

3. Organizational and Managerial Sustainability

The environmental restoration of Haiti will be a decades-long process. Institutional frameworks must be found which can support this process over the long-term. The sustainability of these frameworks will be the subject of the next Section.

3.1. Socio-Organizational Structure to Maintain Local Action

In the most general sense, institutionalization refers to the establishment of regular patterns of behavior or response, whether at an individual or at an organizational level. At the individual level, the AOP is designed to establish the practice of tree cropping among Haitian landowners. An implicit objective of the Project is the development and support of non-governmental organizations capable of promoting tree planting and other erosion control practices over the long-term. This is particularly an explicit part of PADF's mandate.

Institutionalization can occur, of course, without being self-sustained. Tree cropping may be considered successful even if planters receive a subsidy, for example, in the form of technical assistance or free seedlings. In this regard, the AOP is often considered successful. Organizations can effectively promote tree planting over the long-term with the help of outside funds. It is necessary to determine the extent to which individual and organizational self-sustainability is possible and at what pace it can be attained.

What type of organizational mechanisms have emerged which enable the community to sustain the Project activities inde-

pendently of AOP staff and leadership? Has there been created:

1. Local initiative in problem-solving?
2. Local responsibility for maintaining the assets and organization?
3. Local organizations assisting the people to further their self-actualizing process?

Further, have the implementing agencies motivated the poorest of the poor to get involved in taking development processes into their own hands or provided any real organizational structure for them to do so? As mentioned in Chapter V on participation, the poorest have been excluded from the Project's benefits as a result of certain design features and therefore no organizational mechanism among them has developed. In addition, no new social-organizational structures have been built in the AOP since the objective was to strengthen existing ones. The community meetings which were organized by CARE and PADF were only a transitory, short-lived form of group action. Between the meetings that took place in the motivational stage and those after the tree seedlings were planted, no permanent structure of a group action was generated by AOP in the target communities. The only social structure that is maintained after the AOP ends are the strengthened previously existing PVOs. Relying only on PVOs to promote agroforestry development has certain weaknesses which will be mentioned in Chapter VII. To my best knowledge, these existing PVOs have not increased local initiative in problem-solving and have not assisted the people to further their self-actualizing process.

As the Project moves toward the maintenance phase, several questions about organizational sustainability have to be raised. One is the kind of services PADF and CARE should provide to PVOs and what services these organizations should provide to farmers as the practice of tree cropping becomes established. Should the AOP continue to provide subsidies and other support services for tree-planting activities? What would happen to the PVOs if outside funding from AOP would be cut off? Most of the small PVOs still lack sufficient technical competence and economic resources to be self-sustaining. In fact, many PVOs stated to USAID if the Mission cuts off funds for tree planting through the AOP, their tree planting programs will terminate (Benge 1985). Other PVOs will continue their activities since they have managed to find other outside donors.

Project services have to change in this maintenance phase to adapt to the change in planter's activities. Once an area becomes "saturated" with trees, demand for trees will drop and the planters' activities shift to maintaining, harvesting and marketing issues. What will happen to the regional and local nurseries when demand for the seedlings drops? Thus, nurseries might only be temporal (particularly local ones). Extensionists will have to be trained in these new areas to assist the planters in this new phase. Additional problems will arise such as transporting wood products from remote areas (particularly given the poor road infrastructure) to the markets, and the emergence of intermediaries who will absorb the profits of

the tree planters. In fact, several farmers who harvested their trees received poor prices for their products since they lacked information on current market prices and were dependent on the intermediary to transport their product to the market.

What role can AOP play to assist farmers in the marketing of their products? PADF and CARE might be able to support the emergence of small wood-processing industries for lumber, tool handles and furniture or assist local organizations to establish marketing cooperatives to produce fruits and other tree products for exports.[1] In fact, one local organization (CODEPLA) has began (with funds from the Canadian International Development Agency) to organize a cooperative that will sell charcoal directly to the urban market without losses of profit to intermediaries. Creative ways have to be found to maintain or even increase the demand for trees, otherwise farmers might loose interest in continuing tree planting activities.

3.2. Nursery Management

Where no income-generating sustainable nursery arrangement can be established or no community nursery structure can be devised, alternatives to nurseries need to be found. Most Project species are expected to produce volunteer seedlings which could easily be transplanted. Seeds from Project trees can also be used to produce seedlings in farm-level nurseries

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[1] Several Caribbean islands currently have to import fruits to satisfy their demand. This constitutes one viable export place for Haiti.

or be planted directly in fields. Peasant knowledge of seed collection and treatment, and transplanting volunteer seedlings precedes the Project, but its application has not been widespread. The tree cropping practices developed through the Project may now stimulate the greater use of "traditional knowledge". Another example is direct seeding as is possible with Leucaena leucocephala and Eucalyptus camaldulensis, for example. They reproduce by resprouting and thus, lend themselves to several rotations without replanting. An experimental program in hedgerows through direct seeding is currently being implemented on a small scale in the AOP. Another alternative is the establishment of "tree gardens" as the Mayas did. Each farmer germinates in these gardens the seeds of forest trees that will be subsequently transplanted in their fields as part of their elaborate agroforestry systems or their forests (Gomez-Pompa 1987). Another alternative would be to establish community seed orchards where initially a mix of native and exotic species are planted and allowed to mature. Farmers are then allowed to collect the "wildlings" and transplant them on their fields. This approach, however, requires a long waiting period until the trees reach maturity.

Given the emergency of Haiti's environmental (and other) problems, quicker solutions have to be found. Maybe natural regeneration mechanisms could be enhanced mainly by introducing different grazing practices. Or healthy mature trees which correspond to the farmers' preferred species could be declared as a live nursery where naturally-propagated seedlings are

raised. These could maybe be sold to neighbors or traded for neighbors' species to provide an incentive for the farmer not to cut down the tree.

The use of natural reproduction and farm-level nurseries as sources of seed and seedlings has clear implications for the sustainability of the Project. Tree cropping which is biologically sustained from the germplasm produced on the farm itself or nearby farms has a greater chance of surviving reductions in donor interest or ability to support environmental activities in Haiti. On the other hand, the quality of seedlings, including their ability to survive their first six months, will be greatly enhanced by careful selection and production in a professional nursery.

Both CARE and PADF have begun experimenting with very small-scale nurseries at the village and even farm level. While both PADF's "backyard nurseries," and CARE's "decentralized nurseries" are still nascent programs, and it is much too early to judge their long-term potential, they do represent another strategy to ensure that some levels of improved plant propagation would be maintained in the absence of the Project.

It must be added that these local nurseries are seen as complementing rather than replacing the regional production nurseries. Higher-order services such as quality control, supervision, maintenance of germplasm quality and the continued introduction of improved technologies and techniques, all depend upon the regional system. Again, for the foreseeable

future, the Project's long-term, large-scale impact has to be predicated on the regional nursery and outreach system now in place, which must be maintained by major donor financing, until such time as it can be taken over by an efficient public sector.

3.3. Research/Monitoring and Evaluation

All research, monitoring and evaluation tasks are carried out by professional staff of CARE and PADF. Monitors are involved to a certain extent in collecting data, but have never been trained in data interpretation and therefore have not developed an understanding of the importance and meaning of such activities. The same statement is true for the peasants who were never included and trained in participatory action research activities. They have not been introduced to the concept of self-evaluation as a process to foment the emergence of organizational structures capable to take initiative in local problem-solving. Once outside funding stops, research, monitoring and evaluation activities will stop too. PVOs which manage to receive their own funding might continue to perform ex-post evaluations to satisfy donor requirements and might even engage in certain research activities.

4. Technical Sustainability

The nursery technology used in the AOP is often cited as a key element in its tree distribution success. However, as mentioned before, this technology is dependent on imported

plastic seedling containers (particularly rootrainers) and imported materials for potting mixes. Without a plastics industry in Haiti, substitution of imported seedling containers seems unlikely. However, the advantages of the containers currently used are so great, mainly for easy transportation, that their continued importation is considered justified by the Project planners and implementers. Maybe some type of recycling system could be introduced, such as the use of a deposit on the rootrainer, in order to cut the dependency on imports somewhat. The production of potting mixes appears to be more elastic in terms of import substitution. However, attempts to create viable mixes with local materials such as sugar cane waste and rice hulls have not been consistently successful. Operation Double Harvest has developed a local potting mix called "Haiti Mix," which has been successful in its own nursery. There have been problems in the supply of raw materials, however, and PADF's and CARE's regional nurseries have not been able to use the mix successfully. At the local level, there has been a lot of discussion about each nursery producing its own "Haiti Mix" compost for the potting soil in order to rely less on regional and foreign inputs. However, several Foresters believe this is impractical since it takes a high level of technical competence and considerable amount of time to make organic nursery mixes which most PVOs unfortunately do not have. A central mechanized operation seems more appropriate to produce the Haiti Mix. This would also facilitate the inoculation of the mix with mycorrhizal fungi which

improves survival and growth of the trees, particularly on disturbed and eroded sites.

Composting at the local level has been introduced more successfully, however, even though it is considered very time consuming and less effective than using the imported potting medium. The search of a viable local potting mix is continuing in the second phase of the Project.

The procurement of seed from local sources has grown through the course of the Project, as seed sources have multiplied. ODH has created a seed orchard for several exotic species, and CARE and PADF are developing other sources of supply. As the PADF and CARE have increased the ratio of indigenous species in their programs, the identification of local sources of viable seeds has expanded. AOP II includes a contract for a seed collection and tree improvement program which will further reduce the dependency on imported exotic species.

5. Behavioral Change and Social Energy Issues

The Project was setting objectives that required a modified productive behavior. Did the individual farmers respond as expected? The Project has succeeded in stimulating unpre-cedented peasant interest in tree planting. The strong focus of the Project on training and education activities has in-creased the public awareness toward the environment, tree planting, and viewing trees as a crop. There is a continued widespread demand for trees and extension services, and every season groups have to be turned down due to budgetary and

personnel limitations. In addition, farmers have improved their compliance with several of the techniques that the Project teaches for planting and management of trees, such as proper spacing, use of water catchments, weeding and pruning. Another indicator of the farmers' change in attitudes toward trees is the tree survival rate which has steadily increased since 1984. This was mainly due to better tree maintenance. Another indicator is the presence of a large number of farmers who have spontaneously planted trees without being registered with the Project. They received the tree seedlings from a neighbor or friend. However, observations of farmers harvesting their first trees, have shown that they do not necessarily view the tree as a wood crop to be harvested like an agricultural crop (see Chapter V., Section A.4.). Farmers viewed trees more like a savings account (i.e., like pigs before the African swine fever epidemic broke out in 1978), rather than a crop which is harvested regularly.

Concerning social energy issues, the Project did not have the objective to "improve the community orientation of the peasant." Its main concern is assisting farmers to treat wood as a crop. In fact, particularly PADF Project personnel are very skeptical about requests for "communally-owned woodlots" which come from organizers of peasants who are trying to encourage peasants to become more "community minded." In regions where peasant groupmans do have some communally- run productive activities, the Project furnishes trees to such groupmans, but only where the peasant members of the group are also

willing to take trees for their own personal land as well. The Project tends to ascertain whether a "communal organization" proposal truly corresponds to what the peasants in the region are interested in undertaking, or is rather the "pet project" of some higher-level development professional (Murray 1984). Thus, the Project has not served the role of a catalyst that is trying to solicit the hidden potential and advantages of synergistic group efforts (Uphoff 1987).

B. CARE

CARE's centralized nursery system depends on a high level of imported technologies. It considers this the most efficient way to produce large amounts of high quality seedlings. However, in the absence of international support, the operation of these nurseries would cease. In addition, importing growing media, rootrainers, germplasms, fertilizers and pesticides, innocula and shade structures involves rather complicated procurement methods and would be difficult to obtain by local PVOs. Could not the GOH continue to operate these nurseries? CARE has received no support from the governmental agencies and no linkages have been forged so far which could lead to an eventual transfer to the public sector. Even in case such a transfer occurs, the operation will always be subsidized by the GOH unless farmers are able and willing to pay the real cost of the seedling production.

CARE is currently trying to reduce some of the dependencies in imported technologies through experimenting with a

Haitian potting mix, local shading systems, composting and developing seed orchards. Another problem is the dependency on paid extension staff and lack of counterpart organizations. Reliance on a paid extension staff will cause problems when individual communities take on full responsibility for the work. CARE is currently concentrating on recruiting volunteers to work with extension staff and on establishing community-based nurseries which employ voluntary labor. This decentralized voluntary nursery system is introduced in communities where the level of motivation promises that dependence on outside assistance can in the future be replaced by sustainable self-help schemes such as multipurpose tree, fruit tree and vegetable nurseries. However, self-sufficiency seems to be far in the future for hardwood seedling production in community nurseries (and perhaps might never occur). No one would be willing to pay for a species that they could get for free in the central nursery.

Regarding social energy issues, CARE's AOP I exit report (McKenna 1987) mentioned that enthusiasm among community nursery workers was lagging and there was no spirit of community participation. In fact, problems of jealousy often arose in the community because only a few people received money for producing seedlings. It appears that local action depends on paid labor since they were continously asking for a raise in their "salaries." On the other hand, two women's groups have been established which comprise the most motivated of the community nursery workers. The groups have been so successful

that women in many of the neighboring communities have requested CARE to assist them in forming their own group.

Even though CARE's decentralized nursery system moves a step further towards a self-sustaining maintenance cycle, problems of imported technology dependence and paid nursery and extension workers still exist and are likely to continue into the future. There appears to be the potential to produce all nursery inputs locally even though efficiency and quality control might suffer to a certain degree. For instance, other types of containers (rather than plastic bags or small container systems) could be used that can be made on-site, as well as bare-rooting. Another techniques would be the earthball pot which is a mixture of heavy clay soil and compost that is molded around the roots of seedbed-grown seedlings at transplanting size. Further, CARE could stimulate and encourage the formation of local groups (i.e. women groups, groupmans) to experiment with innovative organizational structures to maintain nursery operations. Given the high motivation level among women nursery workers, women Monitors and Animators could be encouraged to start groups with interested women in their own localities. Such groups need not have a nursery as the main focus of their efforts but could have a for-profit vegetable seedling nursery which is selling trees (maybe subsidized) on the side. Or they could start small-scale fruit processing operations.

In order to reduce problems with paying laborers, voluntary rotation schemes could be arranged where each contribu-

ting laborer gets compensated with a number of seedlings according to his/her labor input. In addition, more ties could be created with the governmental agricultural extensionists to train them in nursery and agroforestry management in order to assist the formation of such groups in the future when funding terminates.

It is CARE's opinion that the decentralized nursery concept, once perfected from a technical point of view, may hold the key to long-term project sustainability in the absence of continued external funding. This decentralized nursery system has the following advantages to:

1. Introduce communities and individuals to the idea of seedling production as a small business enterprise,
2. Reduce the Project's dependence on the high input root-trainer nurseries whose high recurrent cost must eventually be reduced,
3. Reduce logistical problems associated with seedling transport by growing the seedlings nearer to the plantation sites and
4. Involve communities and individuals more fully in the entire reforestation process - from seed to seedling to tree plantation.

However, even though community-managed nurseries might be an essential ingredient of a sustainable resource management system, at the end of the Project, this decentralized system will have produced and distributed only 0.6 million plasticbag seedlings, less than 10% of CARE's seedling production between 1986 and 1989.

The expansion of CARE's program for the demonstration and extension of Leucaena living hedgerows through direct seeding might be another step to move toward a sustainable maintenance phase of the tree planting activities.

C. PADF

Concerning economic sustainability, PADF has assisted cooperating PVOs to seek independent sources of funding to further extend tree planting. Thus, some PVOs have managed to reduce their vulnerability to a single source of income and are able to generate their own funding in case PADF's financial support will terminate.

The "seedling purchase agreement" system employed by PADF in its nursery production network, based on the production of seedlings for-profit by PVO-operated nurseries, is currently fully subsidized, either by PADF of other donors who purchase seedlings. With an assured market (i.e., at a fixed price for their seedlings), these PADF-supported nurseries are operating at a profit, and are able to pay off their initial capitalization costs within one to two years. Profits are turned back into their agroforestry programs and help underwrite nursery expansion and/ or some outreach expenses. The goal is that eventually the peasant consumer, rather than the donor organization, will be bearing these costs and supporting at least the local production system itself. Again, this development presupposes both the peasant's willingness to pay anything at all for the seedlings, and his/her ability to pay their fair market value. As mentioned before, because the returns to that investment are relatively longer-term than those to other investments, it may not be possible for all potentially interested participants to pay the real costs involved. Special incentive systems might be needed which will be discussed in the last chapter.

The same suggestions about how to reduce some of CARE's nursery import dependencies are also applicable to PADF's PVO nursery system.

To conclude the subject of sustainability, "To think that the AOP (or its subcomponents) will reach the stage of self-sufficiency in the next few years is naive".[2] Reforestation of any kind is a long-term effort and to educate farmers to realize the value of trees (to a stage where they purchase trees if they can afford them) will take 10 to 15 years. However, there is potential to make some of the activities under the AOP self-sustaining. For example, once the value of contour hedgerows is demonstrated in terms of increasing agricultural production and rural incomes, farmers might begin to establish Leucaena hedgerows on their own since no nursery technology is required. More farmers could be encouraged to produce Leucaena seeds for other soil conservation efforts in Haiti and future project activities. This would generate additional cash. Also, the establishment of school nurseries, linking reforestation to child nutrition, offers promise of making nurseries self-sustaining. CARE is currently experimenting with this strategy. The Project also hopes that with the introduction of improved fruit trees and the development of markets (maybe for export), farmers will begin to purchase the fruit tree seedlings.

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[2] Interview with Michael Benge, USAID, Science and Technology Advisor, FENR Agroforestation, Washington, D.C., January 19, 1988.

Has the AOP managed to create a new social and moral climate bringing forth individual talent and collective action from the farming community for which potential already existed, but which was dormant? Maybe during AOP II and beyond, such talent and collective action can be stimulated.

Let us turn to the lessons learned from the AOP which might assist other organizations to design and implement agroforestry projects which have the potential to become self-sustaining.

CHAPTER SEVEN

LESSONS LEARNED: KEY ELEMENTS TOWARDS SELF-SUSTAINING AGROFORESTRY DEVELOPMENT PROCESSES

What are the lessons learned so far from the AOP which might assist other organizations interested in experimental agroforestry design and implementation approaches? This Chapter summarizes these findings and also identifies concerns which have arisen during Project implementation.

A. General Considerations

Agroforestry Project Experiments: Agroforestry projects seeking to bring about sustained change need to be viewed as experiments. The experimental orientation of the AOP to design and implementation highlights the importance of flexibility, error detection, correction and adaptation. Project flexibility is particularly important in an environment that is characterized by frequent institutional and political changes such as Haiti. The AOP underwent evolutionary shifts in the Project's program as staff learned what worked and what needed modification. For example, the Project experimented with cash subsidies to peasants for planting trees, but dropped them when they proved to be unnecessary.

Shift in Focus: Development agencies in the past have overemphasized the theme of "protecting the soil from erosion." For erosion control projects targeted toward small farmers, the

choice of erosion control techniques may be determined less by the erosion control efficiency of the particular measure than by the ability of the measure to contribute to the profit-making or other objectives of the peasant. This is the main reason why the AOP focused on tree planting rather than on terracing and wall building and other labor-intensive soil conservation techniques which do not provide the farmer with immediate benefits. Projects introducing these techniques have been found to be profitable only with the concurrent planting of cash crops using fertilizers. The difference between fertilizer-assisted yields and traditional crops is large enough to motivate erosion control investment.

In short, widespread soil conservation will occur in Haiti only as a secondary effect of innovations whose primary function from the point of view of the farmer is the generation of a higher immediate income or the satisfaction of certain needs and preferences.

B. Project Cycle Considerations

Among the stages of the conventional blueprint project cycle (identification, formulation, appraisal, implementation and evaluation), the identification phase is very often neglected and fails to take into account the needs of the intended beneficiaries. This has often led to "solving" the wrong problem in past soil conservation projects in Haiti. The learning process approach, on the other hand, emphasizes this phase since accurate identification of farmers' and other con-

straints in the rural social system is crucial to the design of projects if these are to have the desired results. This implies that enough time will have to be spent at the outset of the project development on social studies in order to define the type of strategies and incentives needed to elicit farmers' cooperation. A list of important social variables necessary to consider when designing agroforestry projects is provided in Appendix 10.

The establishment of constructive channels of communication should begin during the needs analysis in the project identification phase. If a participatory environment is not established from the beginning, it is more difficult to establish it later. Special effort should be made to involve villagers in the initiation and design of local project activities. Even though it is more time consuming, the effort may pay off in enhanced local interest and response. Examples of ways to ensure beneficiaries' participation are to:

1. Include them in the decision-making process in all phases in the project cycle,
2. Involve them in gathering socio-economic data, and checking the validity of socio-cultural information gathered by out siders,
3. Involve beneficiaries in keeping records of tree planting activities for monitoring and evaluation purposes of the project,
4. Involve farmers in writing extension manuals in order to assist the new extensionists in carrying out their work and

5. Solicite technical knowledge and historical information from farmers about earlier and possibly similar projects and the reasons for their success or failure.

Engaging farmers in discussions of a technical nature is particularly important in areas such as Haiti where little climatic information or systematic soil data exist. Farmers can assist in designing agroforestry systems since they are most familiar what the limiting factors affecting their land are.

C. Motivational Aspects to Sustain Participation

One lesson that has emerged from the AOP is that fuelwood scarcities, by themselves, rarely seem to be a sufficient incentive for people to grow trees (see Section D.1. in this Chapter). Further, since farmers get little benefit from woodlot land after the first one to two years, farmers with small holdings can seldom afford to maintain them long enough to get a profitable harvest. If we want these small farmers to participate in the benefits of tree planting activities, some assistance has to be provided to replace their forgone income from the land. Special incentive schemes can be devised to encourage the participation of the poorer and landless farmers. For example:

1. **Access to Credit:** subsidized loan programs could be provided or where the farmers continue to produce agricultural crops, access to credit could be assured. Special arrangements could be negotiated with lending institutions to pro-

vide credit to formerly "credit unworthy" farmers. Trees could be regarded as a collateral to provide banks with a certain security.

2. **Advanced Payment:** the value of trees at the end of five years may be estimated based on current market prices. Then, the farmer might receive every cropping season a fraction of this amount in anticipation of the future harvest. At harvest time, he/she will only receive the differential between what he/she was already paid and the current value of the tree. Another alternative is to enter into an agreement with lumber-mills which pay, in anticipation of the future harvest each year, a fraction of the final value of the trees. This would serve as another incentive to protect and maintain the tree throughout its entire life-cycle. A similar idea has been introduced by the Western Indian Match Company (WIMCO) in Uttar Pradesh. This scheme could also be implemented by a NGO. The main disadvantage, however, of such a scheme are its high administrative and organizational implementation costs.

3. **Fertilizer or other Agricultural Inputs:** access to agricultural inputs could be provided to farmers who agree to plant trees.

4. **Land Title:** given Haiti's situation of "deedlessness", granting formal legal title could be used as an incentive to promote tree-planting.

Other examples how to include marginal groups in the Project's benefits are listed in Section G.1. of this Chapter.

Future profitability of trees has been cited as an important incentive to participate in the AOP. However, farmers with small holdings lack economies of scale for cutting, transport and marketing. The prices they get may be significantly lower than the prices paid to larger operations. Individual farmers are also in a poor position vis-á-vis tree crop buyers. In regions where tree farming is relatively new, markets are likely to be poorly developed. The price oscillations caused by these marketing constraints may be too great to sustain participation by individual farmers who cannot afford such risks. Thus, if organizations promoting tree crops do not plan adequately for marketing, they may be setting farmers up for disappointing returns and disenchantment with trees as a crop. Such organizations could promote tree-grower cooperatives or assist farmers in marketing their products. Various other market support measures could be introduced if agreements with the government can be reached such as favorable wood prices, and governmental assistance in wood marketing. This would ensure a guaranteed market for wood products, providing a strong incentive for farmers to establish and maintain trees.

There are also technical constraints which might undermine the profitability of farm forestry due to inadequate follow-up by extensionists to advise farmers regarding management practices. In this regard, the AOP has set a good example on the importance to provide sufficient technical follow-up to assure that farmers' benefits from the trees are substantial enough to sustain their commitment.

D. Technical Considerations

1. Choice of Species and Site Decisions

The Project began with the assumption that rapid cash returns to market-oriented fuelwood production would be the major driving force behind acceptance of the seedlings. The promotion of charcoal trees also had the advantage that being resistant to drought and unfavorable soil conditions, they could survive where other types of trees (especially fruit trees) could not. However, integration of tree planting into a farmer's farming system entails use of multipurpose species which satisfy his/her needs not only for fuelwood, but also for shade, fodder, construction poles, etc. Species suitable for animal fodder, with fuelwood as a secondary rather than primary benefit, integrate better into a farming system with a livestock component. This points to the importance of understanding the farmers' decision-making process in order to match the choice of tree species, tree planting purpose and tree management practices effectively with the farmers' complex calculus of survival needs. This reaffirms the need to include farmers in the decisions to be made regarding technical aspects of project design.

Participants have repeatedly demonstrated that they are interested in 1) a wide range of end-products, 2) slower growing species that produce higher value timber, 3) fruit trees, 4) construction wood and lumber, 5) production of a variety of end-products for home consumption rather than sale and 6) the value of standing trees for a number of reasons

("banking account", soil conservation, aesthetics, etc.). This has proven to be the case even in areas where charcoal production is a "traditional" local activity.

The relative mix of species used in the Project has tended to vary significantly over the past six years; however, in response to farmers' preferences and survival and growth data of the Project's trees, the following key characteristics in the choice of species have been determined:

1. **Peasant Interest:** The species must ultimately be acceptable to the farmer. This is difficult for the farmer to assess in the case of exotic species brought into the community; nevertheless the concerns of the client are a determining feature of species selection. Once farmers gain experience with new species, they express certain preferences. Therefore, it is important to understand the farmers' decision-making framework in tree planting as elaborated in Chapter V.

2. **Hardiness:** Trees should demonstrate resistance to drought, insects, disease, and be hardy to growing conditions on highly degraded planting sites.

3. **Hardwoods:** The Project specialized in fast-growing tropical hardwoods, but due to farmers' interest, it had to diversify its species and is now introducing fruit and forage species. In addition, it is also experimenting to introduce certain commercial export species such as cacao. For a listing of native and exotic species distributed, see Appendix 11.

4. **Intercropping:** Trees should lend themselves to intercropping arrangements and not interfere with the farmers' food and livestock production. This may take the form of agroforestry systems (i.e., alleycropping, hedgerows) or treecropping in which the trees have a relatively neutral relationship to other cultigens (i.e., border plantings).

5. **Limited Maintenance Requirements:** Farmers clearly favor the cultivation of species which require relatively few labor inputs, mainly due to labor shortages and limited capital available to hire labor.

6. **Fast Rates of Growth:** The Project selects trees which have a relatively quick turnaround time in terms of harvest and

regrowth (4-6 years).[1] This is an incentive in an agricultural context where perennials have a slower rate of return on the farmer's investment compared to annuals.

7. **Re-coppicing:** Trees are preferred which re-sprout after being harvested. This lends itself to several cycles of regrowth and harvest and promotes tree cropping as a renewable natural resource.

8. **Nitrogen Fixation:** There is a preference for trees which are beneficial for soil improvement and green manure, even though no research so far has demonstrated such beneficial effects. Such trees lend themselves to intercropping with food crops.

9. **End Use:** The Project has introduced trees which lend themselves to fuelwood use. This was inconsistent with farmers' interest in multipurpose species. Thus, species selection has to take into account the farmer's end use of trees (e.g., for construction, poles, home consumption, market, fencing, soil conservation, etc.).

The Project intended to plant trees on plots where mountain agriculture is practiced. If the trees can be planted at the beginning of the cropping cycle, they will not interfere with traditional cultivation and will be freed from the danger of animals, since peasants take strong precautions against the entry of animals into such garden land. The survival rate of trees planted on mountain garden land was much higher than that of trees planted on marginal pasture land. This is mainly due to the destruction of trees by animals grazing on the latter.

Project designers have to realize that there are a number of different potential beneficiaries or "social actors" and that they are not equally served by different agroforestry technologies. The appropriateness of various tree-planting

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[1] With the introduction of precious hardwood species for construction purposes and fruit trees, the length of the harvest cycle has increased significantly, however.

technologies to one or another local situation is not neutral to social structure. The socio-economic characteristics of the farmers and the dynamics of the local tenure system and land availability will determine which technology is most appropriate in a given situation. Again, letting the farmer decide which species to plant and the planting technique to adopt appears the easiest solution to this complex problem. The AOP provided an example of how extension workers can play a less directive, but supportive role to farmers who tailor the planting configurations and choice of species to their own particular needs and local site conditions.

2. Nursery Decisions

2.1. Centralized vs. Decentralized Nurseries

In a centralized nursery, seedlings are planted and cared for by nursery specialists. These large nurseries are usually run by paid professionals. Peasants merely receive the shipments of plants when they are ready to treat the hillside. The main advantage is the efficient production and better quality control. The main disadvantage is the dependence on the outside for costly inputs. Further, the decision about what to plant in nurseries is not made by the peasants, but by the nursery organizer.

In a community nursery, peasants are responsible for the entire process, sowing, watering and caring for their own nursery stock. The advantages are: more involvement of peasants in the decision-making about which trees to grow; they

make a resource commitment through the contribution of their labor which is often regarded as a crucial element for creating sustainable projects and less dependence on outside actions. The main disadvantage is that the technical skills of the participants maybe low (particularly if a rotational management schedule is arranged) which may result in lower quality seedlings and higher costs of production. The major tradeoff between the two options appears to be between efficiency/quality of seedling and local participation -sustainability issues.

The key to self-sufficiency of community nurseries lies in the production of high-demand plants that can be sold for at least a fraction of their production cost. Production of fruit trees and grafted trees with improved buds, could provide one way to make these nurseries more self-sustaining. In fact, in some areas in Haiti, farmers pay up to $5 for a graft with imported budwood.[2]

2.2. Number of Seedlings to be Distributed

We learned from the AOP that the initial 500 seedling requirement per farmer was too high and created an entry barrier for smaller landholders. If a prior study could have estimated how many trees a family needed to become self-sufficient in its fuel and tree-product needs, a more appropriate answer could have helped to set limits on the distri-

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[2] Interview with Michael Benge, USAID, Science and Technology Avisor, FENR Agroforestation, Washington, D.C., 19 January, 1988.

bution of seedlings. Estimates have ranged from a low as 25 trees to as high as 220. A study in West Bengal, India has demonstrated how a 20 square meter area of closely spaced (1 x 0.5 m) biannually cropped Leucaena can supply a family's fuelwood and fodder needs. That is only 55 trees (Energy/Development International 1986).

2.3. Spacing of Trees

This topic will be briefly discussed in the next Section on Protection and Maintenance.

2.4. Planting Configurations

What type of planting is to be encouraged depends on land distribution patterns, the goal of the project, and the needs and priorities of the beneficiaries. The AOP initially encouraged block planting since it proposed that farmers use trees as a cash crop. As the Project proceeded, other planting configurations were encouraged such as hedgerows and boundary plantings.

2.5. Timing of Nursery Activities with Extension

Past reforestation tasks had the tendency to define the establishment of a nursery as the principal and most problematic task of the project. Thus, many projects have found themselves with rapidly maturing nurseries before it was decided who the beneficiaries of the seedlings would be. The experience of AOP has shown that the major task is not a tech-

nical one of establishing a nursery, but the organizational/ motivational task of inducing communities to plant and maintain the trees.

In addition to timing nursery activities with the motivational aspects of tree planting, there is a need to transplant the seedlings at a time when there will be rainfall in the recipient community. Thus, nursery activities and shipments have to be coordinated with the climate of the recipient communities.

3. Protection and Maintenance

Project results showed that peasants can be motivated to plant trees, but are less likely to maintain them. Extension and training should strongly emphasize critical, low-input procedures for enhancing seedling survival. Maybe other maintenance incentive schemes can be explored, such as listed in Section C of this Chapter. Also, species should be very hardy, requiring minimum protection and care.

The principle destruction of trees stems from the interference with the local livestock economy. What provisions did AOP provide for the protection of trees? Experience indicates that peasants are more likely to take care of trees if the trees are planted close together in a row (1 m apart) and if several rows are juxtaposed to form a mini-lot. This creates an impressive visual package which the peasant is less likely to expose to an animal. If each mini-lot is separated from the next by about 15 m of open field, the peasant has space to tie

livestock. Trees should also be planted close to home so they can be better protected from livestock and thieves.

The practice of planting trees and abandoning them to hazard can be avoided by incorporating a maintenance phase into the project plan. Various incentive schemes can be provided to farmers to encourage them to maintain their trees. Several examples have been given in Section C of this Chapter. Frequent visits by the animator or extensionist are necessary to provide the necessary support in this maintenance phase of the project.

4. Land Use Planning

In order to increase the effectiveness of erosion control purpose of the Project, it should be designed to incorporate all watershed inhabitants into rehabilitation work. This requires organizing a group structure tailored to the physical unit to be protected (such as a watershed). This topic will be expanded further in Section H of this Chapter.

E. Choice of Implementation Agencies

Crucial to the success of a project is the design or choice of the organization in charge of project implementation. At the AOP design stage, there was no effective soil conservation/ reforestation unit functioning within the GOH. However, there existed a number of international and national PVOs which had shown themselves capable of mobilizing community action and which were interested in engaging in tree

planting activities. As a result, one of the central features of the AOP and one of its major operational strengths, has been its decision to work outside of the formal governmental structures through which such projects are generally channelled. Does this experience show that future agroforestry projects should all be channelled through NGOs? What if in some countries NGOs are too weak or nonexistent to carry out project activities?

Role of NGOs

NGOs have the advantages of flexibility, dedication and the ability to reach down to the lowest rural levels. Other advantages of working through NGOs are:

1. Provides an alternative in situations where the general peasant attitude to governments and foreign agencies is one of distrust and suspicion,
2. Serves as a training ground for conventional foresters who have to shed their role as protectors of forests <u>against</u> the people and work <u>with</u> people for growing trees which requires different attitudes and skills and
3. Can adapt untested cultivation techniques and develop extension programs.

The following are some characteristics required of NGOs or PVOs involved in agroforestry development, in order to play an effective role:

1. **Continuity:** A commitment to raise trees is a commitment of time. An organization whose life cycle is subject to the vaga-

ries of local climatic or political season cannot be confidently entrusted with tree planting activities. Among other factors, continuity depends upon trusted leadership.

2. **Legitimacy:** An organization which will influence decisions about the use of valuable land, water and labor resources must be perceived as legitimate by the local people involved, and by the government. Legitimacy normally stems from a respected record of performance with the target group itself.

3. **Expertise:** For a decentralized tree planting program to be effective, various types of expertise are required. These may be broadly classified into two categories: technical and social. Both are derived from research and experience. Technical expertise provides the basis for making sound choices in the selection of tree species, location and timing of planting and methods of care. Social expertise is required for effective execution of these decisions.

The disadvantages of working with NGOs are as follows:

1. In the case of Haiti where very few indigenous PVOs existed due to a prohibitive political climate, most PVOs have strong ties with foreign countries. These PVOs are dependent on foreign resources and have a difficult time to mobilize their own resources since the peasants are unwilling to contribute to an organization which they perceive as foreign and not their own. Thus, fostering self-sufficiency in such PVOs will be nearly impossible and once outside sources are stopped, they will dissolve. This happened with HACHO.

2. Uniform coverage of a geographic region might not be possible if the PVOs are localized organizations, or serve only their members or groups which meet the organizations' own criteria.

3. The technical and management capability of very small or amateur organizations could be easily overwhelmed if sophisticated nursery management and timely and rapid delivery inputs are essential to project implementation. Significant project investment might be required to strengthen their capability. Critics argue that such investment should be reserved only for government or indigenous, not foreign, organizations.

4. PVOs might not be able to cope with situations where they are suddenly forced to expand their operations, at least without losing their efficiency in serving their clientele. Other disadvantages are dependence on personalities, inadequate funding, sustainability problems and varying governmental acceptance of these organizations. There is, however, also the necessity for governmental support for a project. Without government commitment of finance, staff, policy declaration and legislative support, there can be no successful sustainable agroforestry project or program. This issue will be discussed later in Section M of this Chapter.

When choosing implementing agencies in a weak public sector institutional landscape, it would be unwise to put all eggs in the same basket. The outcome of the projects is too important to subject it to possible failure because of extraneous factors associated with the weakness of a single imple-

mentation agency. The AOP has reduced such a risk by dividing the implementation tasks between two organizations. Then, within these implementing agencies, the tasks were further shared by local PVOs. The risk of failure is thus minimized since the failure of one subproject does not impede the continuation of the others.

F. Legal Aspects

National tree laws which require permission to cut trees or payment of a tax for the privilege of cutting a tree are often stated as a major obstacle to motivate farmers to plant trees. Even though the GOH had established such laws, the Project did not encounter a community that hesitated to plant trees because of fear of future governmental restriction on cutting. The virtually unanimous opinion of peasants consulted on this matter was that a person who plants wood will be able to "settle matters" with local authorities. Thus, the key variable in Haiti is ownership of the tree that is planted on one's property. Once the ownership right is guaranteed, the peasant feels free to plant trees. This was one of the key message of the publicity campaign of the AOP. The farmer is repeatedly assured that the Project forfeits all rights in the tree once he/she accepts it and plants it on his/her land. This assurance is institutionalized through a standard contract between the tree planter and the NGO providing free tree seedlings.

One of the general principles to which both parties agree to adhere is the right of the peasant to harvest the trees

whenever they can be of economic use to him/her. This reassurance is of incalculable importance given that one of the problems that has undermined the effectiveness of many past reforestation activities has been the fear on the part of peasants that the trees planted are not theirs. This was particularly a problem when farmers were paid food-for-work to plant trees. They commonly referred to those trees planted as the company's trees, referring to organizations such as FAO or USAID, or as government trees. To avoid this problem, tree planters must be assured (preferably with a written statement) that they, not the project, are the owners of the trees.

Another area where a foreign donor such as USAID could have a certain influence is the legal framework regarding tree cutting. The foreign donor could assist the GOH to revise its laws in order to promote tree planting rather than create disincentives. For example, a policy could be established which would penalize only peasants who cut down trees without replanting new seedlings. In several European countries there exists a law that requires the planting of three new trees for every tree cut down. A similar law could be instituted in Haiti. A special tax could be introduced for tree cutters who do not replant trees. These revenues could be utilized to sponsor reforestation projects undertaken by the GOH or local NGOs. Small revisions of existing laws can be encouraged to further Project effectiveness, without the need for completely new legislation.

To sum up, the AOP experience taught us that when entering into contractual agreements with individuals, it is important that the rights and obligations of the parties are clearly spelled out and are simple enough to be understood.

G. Socio-Economic and Cultural Aspects

One of the salient features of the Project is that it based its technical content on a detailed analysis of the socio-cultural and economic characteristics of its intented beneficiaries. The project conceived of trees as an integral part of the Haitian peasants' economy and designed its technical intervention around the peasants' needs and desires. This leads us to the main lesson that future projects must not only provide technically sound agroforestry practices, but must simultaneously open up convincing avenues of new benefits if the measures are to be adopted.

1. Reaching Marginal Groups

1.1. Landless and Near-landless farmers

The AOP has not addressed the needs of these segments of rural Haitian society. What possibilities exist to incorporate them into agroforestry projects which are generally targetted toward the landholding peasant? A few suggestions are to:

1. Employ them in the Project (i.e., as nurserymen, extensionist/animators, truck drivers and other support staff)
2. Train them to establish their own nurseries (including courses in grafting, innoculation with bacteria, etc.) to sell seedlings lings to other farmers and

3. Organize groups of landless farmers and lease public land for them to use; give them guaranties of tree ownership.

1.2. Women

Haiti has the highest rural agricultural labor force participation rate for women in the Caribbean and Central America. In 1980, 53% of the labor force in agriculture were women (OAS 1980). However, socio-economic field studies showed that only 19% of the planters were women (Buffum and King 1986).

Experience with women's groups in the AOP has been limited. The AOP has not undertaken an effort to involve them in treeplanting activities. Given that women in Haiti and elsewhere often spend long hours collecting fuelwood, they would appear to be the ones most directly interested in producing fuelwood. A small group of women, offering mutual help and cooperation, appears to be a more effective social device than if each woman spends the same amount of time and labor on individual farm forestry activities. Women also need to be consulted when choosing which tree species to grow since their needs and preferences might be different from their husbands'(see Fortmann and Rocheleau 1985, Hoskins 1979 and Rocheleau 1985).

2. Timing Issues

The AOP carefully studied the seasonal labor calendar before planning of seedling distribution and training occured.

It is important that tree planting does not conflict with other duties on a seasonal basis.

Technical and material inputs arrived promptly at the exact place and time promised. This helped to establish credibility, particularly since previous programs or organizations have not kept their promises or delayed distribution.

3. Labor Availability

Although on a seasonal and regional basis, surplus labor is potentially available, critical labor shortages may still be a problem at peak times of labor demand. If the demands of tree-planting and care can not be integrated into cycles of labor availability in a manner which balances supply and demand peaks, the additional burden of trees (often upon women) may be viewed as unacceptable.

4. Security of Land Ownership

It is often claimed that people will not plant trees without land security. However, in the case of Haiti, Murray's studies (1979) reached a different conclusion. He believes that rental and sharecropping arrangements can be stable over several years and there is no reason for assuming that fast growing trees could not be planted under some type of tenancy arrangement. Under AOP, most of the trees were planted on owned property, but this is not surprising, given the Project's policy of limiting its coverage to farmers who have

secure title to their land. Despite this, several tenants and landlords took the initiative to work out sharecropping arrangements to their mutual benefit. Observers concluded that the profitability of the agroforestry package promoted by the Project and the landlords' agreement to a share-cropping arrangement provided sufficient incentives for the tenant farmers (Univ. of Maine 1986).

5. Historical Information

The AOP design points to the importance of historical information. Murray (1979) based his recommendations for designing the project on an analysis of 25 years of erosion control in Haiti. Thus, the new project learned from past failures and successes and incorporated the lessons learned in the new project design. Another more participatory way to bring past development experience to bear on the new effort is to involve intended beneficiaries in the Project design. Local people have a good memory of past projects with their negative and positive elements. This may prevent repeating past failures.

H. Organizational and Administrative Decisions

1. Payment vs. Voluntary Participation

Perhaps the most important decision to be made which will deeply affect the course of the Project is the decision whether to pay people in one form or another. The strongest arguments against payment are as follows:

1. Payment can lead to the mechanical, obedient implementation by the community of useless projects for which there is no genuine local felt need and in which the community's only stake is the money (or food) that will be received.
2. Payment upsets those local projects which have succeeded in operating on a voluntary basis.

Arguments in <u>favor</u> of payment are:

1. If trees are planted with little immediate value to the hillside farmer and with the main objective of protecting lowland irrigation systems, the farmer should receive financial support for time and labor expended in activities whose major beneficiaries live downstream.
2. Poor farmers cannot be expected to participate in projects whose benefits are unsure in the distant future.
3. The U.S. Government has provided direct financial assistance to farmers willing to implement soil conservation measures. Why should the Haitian farmers be denied the types of cash subsidies that have been found necessary to elicit farmer cooperation in the United States?
4. The benefits of tree-planting have not yet been proven and project participants are exposing themselves to risks which they are unable to bear. Some form of direct support has to be given to the risk-takers until the trees have proven their economic value to the planter. Payment can be utilized as an interim measure designed to usher risk-taking communities through the first cycle of fast-growing trees. Also, because of the long time lag between planting and harvesting trees,

and because small farmers cannot afford to wait several years for income, special incentives will be needed in certain cases as has been discussed earlier in Section C of this Chapter. Imaginative incentive systems can be developed with knowledge of local culture and value systems and can be linked to other activities which stimulate the farmers' interest.

2. Individual vs. Group Action

What units of social organization are most appropriate to sustain agroforestry strategies? This is a fundamental decision all project designers and implementers have to face. The focus of the AOP was the individual farmer and family unit as the major social unit to perform the intended activities. Even though this approach appeared very effective in increasing farmers' interest in tree planting, there are limitations to focus only on individuals. As we have seen, certain social classes were neglected such as the landless farmer or tenants. In addition, planting trees on only some land plots along a steep hill is not an effective erosion control method. More coordinated efforts are needed to reduce erosion problems and to have a beneficial impact on agricultural production. An alternative would be to aim for group-centered approaches organized according to ecological location (i.e., all farmers living in a watershed or a hill), age, schooling, gender or social strata (i.e., landless farmers). Other forms of organizations, such as tree grower's associations or cooperatives, may also be economically beneficial to assist farmers in the marketing of wood or the management of nurseries.

Should the planting of trees be the task of the landowners or of a community group of some sort? The most effective division of labor appears to be one in which some people carry the trees up the hill, others dig the holes and yet others do the actual planting. Since planting itself is a skilled task, it could be left in hands of specially trained community members.

3. Building Local Organizations

The most important functions of effective local organizations are, among others (for a more comprehensive list, see Esman and Uphoff 1974) to:

1. Provide a mechanism through which farmers can share in decision-making,
2. Develop a two-way communication system between project or government staff and farmers, as well as among farmer participants themselves,
3. Promote and reinforce of behavioral changes such as atti tudes toward tree planting and the change in social energy and
4. Mobilize local resources for other rural development activities and maintenance.

The question then becomes one of how to develop locally appropriate farmer groups that ensure the flow of benefits to their participants. The most natural basis for group formation is the preexisting local pattern of cooperation. In Haiti such cooperative arrangements exist, but the Project was not will-

ing to foment such groupmans because they had no managerial and administrative expertise. It was therefore hard to work with them since the Project had to comply with certain reporting procedures.

I. Extension and Training Considerations

The experience from AOP suggests that the following points be considered in designing extension and training strategies for agroforestry projects:

Farmer-to-farmer approach: Farmers are often wary of governmental officials and outsiders offering advice on how they should modify or change their farming practices This is particularly true when the advisers are infrequent visitors and are not able to understand local conditions. Therefore, farmers often ignore the advice given to them because they do not trust the intentions of the extension workers. To avoid this problem, the AOP recruited and trained local farmers as Animators and/or Monitors. They were also encouraged to set up demonstration plots at their farms. As adapters themselves, these farmer-extensionists gain more easily the trust of other farmers, particularly since they have tried the new technology by themselves. In addition, the extension staff lives near the project sites which enables them to regularly visit farmers. Recruiting and training farmers to assist in extension work is one a way to mobilize local resources and encourages more local participation in agroforestry projects. Another very effective initial educational strategy in the AOP

was to sponsor visits to demonstration sites and farmer-to-farmer visits. Farmers from one region were invited to visit farmers who had adopted an agroforestry technology. This not only facilitated the diffusion of technical skills, but also helped to diffuse possible worries about eventual loss of land. Also, the visits have encouraged farmers to educate each other rather than relying only on extension agents.

The selection of extension workers is also very important. Usually, more progressive farmers or farmer leaders are preferred. In the AOP, literate farmers were preferred. This often creates a problem to reach the marginal groups which are not part of the clientele with whom the better-off farmers normally interact. To avoid this problem, representatives of different segments of intended beneficiaries have to be included, such as women and small farmers, to convey the message most efficiently. This requires intensive training to endow the farmer-extensionists with adequate knowledge of the tree species and agroforestry techniques to be promoted. To ensure the technical competence of extension staff, close supervision is often required. Thus, a combination of both village extension workers from the agricultural department or expatriates with better technical training and local animators might be the best method to reach the intended beneficiary. This need for both technical expertise and local farmer-extensionist is reflected in CARE's better tree survival rates compaired to PADF. CARE was able to supervise its extension staff more closely than PADF, which worked only indirectly with the extensionists through the subgrantees.

In the early learning phase of the Project when the agroforestry technology is not proven yet, the extension staff have to become facilitators by assisting a two-way information flow between project staff and farmers.

Another creative extension approach (which is currently being developed in CARE's AOP II phase) is the use of school nurseries. Given that 44% of Haitians are under 14 years of age and education is free and compulsory for six years, schools seem to be an effective way to train and educate the students in deforestation and conservation problems. School nurseries, miniparks, fuel plantations and fruit orchards (planted by school children) can serve as an effective medium to teach the new generations the value of trees. Also, more efficient stoves can be demonstrated if hot meals are served at the schools. In addition, income can be generated to pay for school expenses while at the same time raising the awareness of children regarding the links between environment and development. Each student is a potential extension agent and can easily influence parents by taking home tree seedlings to plant around the house. Institutional arrangements in the form of a partnership between school, communities, and government agencies could effectively formalize and increase the support for agroforestry development (see Chowdry 1983). In addition, institutionalizing environmental education and the establishment and maintenance of school nurseries in the regular curriculum of primary schools, appears the be the least expensive and fastest spreading extension outreach approach.

Further, given that the media are nearly under total control of the GOH, it would be very effective to use this powerful medium to convey messages and stimulus to the population concerning tree planting. During AOP II, CARE is trying to make such arrangements with the Catholic station, Radio Soleil.

K. Research

In general, research activities within development projects can be categorized as 1) applied or operational, where the main goal is to to monitor the proper implementation of the project, and as 2) scientific, where new knowledge is created and transfered to outsiders.

Applied research conducted by CARE and PADF has been useful for their improvement of their program in nursery production and extension. Questionnaires on site conditions and planter behavior, survival tallies and species trials have filled a didactic purpose and have imparted some information. To continue research activities in the longterm, however, a more participatory action research mode has to be developed. Local people have to be taught of the importance of research to improve and monitor Project activities which will also benefit themselves in the long-term. The NGO can provide an effective framework to stimulate adaptive, flexible and more participatory research involving the local "end user" in its planning and execution. However, the PVOs were not able to conduct experimental research to address the vast data and

information gaps concerning the fields of agroforestry. Information gained was not transferred to outsiders, mainly due to the overextension of staff and time constraints. Thus, a centrally-organized research unit within the project could perform this role and thereby relieve the PVOs of their research responsibilities which are not directly relevant to their other implementation responsibilities. As mentioned in Chapter III, the AOP added a special research unit which was in charge of conducting scientific research. Unfortunately, little coordination existed between the research needs of the implementing agencies and the University of Maine's (UOM) research agenda. The central research unit of the AOP could redesign itself toward more responsive and applied research, conducted in collaboration with the PVOs and local people. In fact, progress in this direction has been made during AOP II since CARE and PADF have hired a research scientist to liaise with the central research unit. The main problem left to resolve is how to involve the end-user in agroforestry research. Much can be learned from experiences in other parts of the world which tried to adopt a participatory action research or end-user perspective (see Rocheleau 1987 and Chavangi 1987).

L. Project Linkages

Natural resource management activities, such as agroforestry, need to be integrated with other rural development activities. For instance, in the Northwest area where CARE operated, many roads are nearly impassable and their repair

would greatly facilitate the AOP work in that region. Adequate infrastructure is also necessary to expand marketing possibilities. The AOP could coordinate its activities with other projects, such as the Winrock Goat Project, to carry out its activities. For instance, for every goat distributed under the Winrock program (or pigs by other organizations), the recipient could plant a number of forage trees such as Leucaena. A forage production activity can be undertaken in cooperation with the distribution of goats. Goats are very destructive since they damage newly-planted trees and prevent natural regrowth of vegetation. Farmers cannot be expected to tether and feed goats unless surplus forage is made available.

Another problem is the lack of a coherent policy among the 116 soil conservation projects currently underway in Haiti. Various projects use different implementation approaches, many of them contradicting each other. For example, a project implemented by FAO uses food-for-work incentives for tree planting activities while the PVOs try to abolish such incentives in the same region. Such lack of coordination and unified agreement often undermines the effectiveness of the various projects. One advisor of the Division of Natural Resources tried to establish a Reflection Committee to address such basic issues as peasant renumeration and alternative motivation strategies.[3] The plan was to bring together various participants from the GOH, international organizations (FAO,

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[3] Interview with Toby Pierce, former Advisor to the government of Haiti, Division of Natural Resources, Washington, D.C., January 21, 1988.

USAID, CIDA, IDB, GTZ),[4] NGOs and the private sector involved in soil conservation projects to establish and agree on a National Policy regarding forestry and other conservation activities. Unfortunately, only three such meetings were held before the Committee was dissolved before reaching any agreement.

With the change in GOH and the establishment of the Service for Forest Resources, I hope that such an agreement might be reached when devising the New Forest Program for 1988-1993. Establishing a coordination committee within the GOH appears to be the most effective mechanism from an operational point of view to forge common understandings and share information.

M. Institutionalization - Linkages with Government

There is no incompatibility between the objective of strengthening governmental institutions and the supporting of PVO projects. In fact, the PVOs have been in several cases providing an excellent training ground for government technicians.

Agroforestry activities can not occur in isolation from other development activities. As mentioned before, the absence of roads and distance from markets will hinder the development and sustainability of future agroforestry activities in some regions of Haiti. Thus, institutional support is required to

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[4] see list of acronyms and abbreviations at beginning of this report.

coordinate various development tasks which will have an impact on the continuity of agroforestry practices.

The AOP bypassed the governmental framework. Thus, there exists no incentives for the GOH to support the continuation of the Project or to build on its experience. Mechanisms have to be found to encourage involvement of governmental staff. For instance, GOH personnel could be hired to fill certain technical and administrative roles, thereby gaining first hand experience. In addition, GOH personnel can be included as members of evaluation teams so they can see and hear the effect of the AOP approach. They could also be invited to certain technical retreats where USAID personnel meet with the implementation agencies and other interested PVOs.

N. Behavioral Changes in International Funding Agencies

Even though learning process models have been effective, they are difficult for foreign donor agencies to accomodate because of the requirements for flexible and incremental funding. The AOP offers a variation in the design of USAID projects, allowing the implementation agencies the possibility for incremental funding. However, the procedures to apply for an extension of the Project were still cumbersome and did not endow the grantees with the flexibility required to experiment with a more "adventurous" learning process approach.

How can international donors support this process approach such as the creation of flexible mechanisms for testing alternatives during implementation? One possiblity is to fund

more institutions or NGO intermediaries (such as PADF and CARE) which can support learning process projects with the necessary patience and flexibility. Another example is the Small Project Program of the Interamerican Development Bank which gives loans up to $500,000 to intermediary organizations capable of distributing smaller sums to local organizations.

Another major problem of international donors and governments is the pressure to spend funds within a certain timeframe. One device, as suggested by Chambers (1987a), is to relieve this pressure to spend by supporting parallel blueprint projects to absorb the funds. Other uses for aid budgets must be found such as debt relief, debt for land swaps, and foreign exchange support. Maybe a special fund can be created within the existing agencies which can disburse money rapidly without the normal bureaucratic procedures. In addition, more staff are demanded by the new approach. Many NGOs have learned that rural development from which the poorer gain is staff-intensive, and this intensity has to feed back into the donor agency. In addition, the quality of the staff can be improved by hiring more social scientists to participate in the entire project cycle. In fact, the inclusion of anthropologists in the design and implementation of the AOP has clearly contributed to its partial multidimensional success. Another area where donor agencies like USAID could contribute is through ensuring the continuity of the field staff. Special incentives could be offered to gain a long-term commitment of the field staff. They may be nationals or foreigners, but unless they

are able to stay for several years in the same rural place, they are unlikely to nurture effective learning processes. Project proposal guidelines also have to be changed to include a special section on the economy and social organization of the peasant communities in the intended project region.

The proposal should be specific about the manner in which maintenance of the trees will be assured. Further, emphasis should not be so much on physical achievement (i.e., the number of tree seedlings planted), but rather on creating mechanisms that ensure the continuity of the process. In addition, if the project includes a training component for agroforesters, training in the economic and social organization of the communities in the project area should be provided.

Donor agencies should invest resources in the complex of activities associated with participation at the design and implementation stages. More support has to be given to the social and institutional components. This requires the hiring of staff with training and experience in these areas. The experience with AOP demonstrated the value of including anthropologists in the planning and implementation of projects.

International development agency staff such as planners, administrators and technicians have to move from the old paradigm of normal professionalism towards the new paradigm of "new professionalism" (see Chambers 1986). This requires a reversing of the view that people are "the problem" to a view

that they embody "the solution." To promote collaborative development efforts with the beneficiaries will require a retraining of existing staff or hiring new personnel with the necessary skills and motivation to induce such a process. Other elements of a bureaucratic reorientation strategy supportive of participatory projects includes changing personnel practices, rules, incentives, and procedures which are discussed in detail by Tendler (1975), Bryant (1980) and Korten and Uphoff (1981). Lastly, the length of agroforestry development projects has to be much longer than the usual three-to-five year project periods. If behavioral changes are to be expected from the peasants, agroforestry projects need to expand their horizons to at least ten-to-fifteen years.

0. Concluding Remarks

This study has described and analyzed the progress and problems o a large-scale agroforestry Project in one of the most difficult developing country settings in the world. Haiti is not an easy or hospitable environment for the promotion of sustained socio-economic development.

A success in one country can not be easily transferred to another. Each project has to be tailored to the needs of the intended beneficiaries and take the socio-cultural and ecological conditions of the project area into account. However, this study has tried to distill the essential elements which might serve as guidelines and examples for future agroforestry project designers and implementers.

Haiti's fuelwood and natural resources crisis will not be resolved by planting trees alone. Alternative fuel sources have to be developed and more energy-efficient stoves must be introduced. In addition, tree planting activities have to be integrated with other rural development activities which try to address the alarming situation of the Haitian rural poor.

Building toward sustainable development in Haiti continues to prove itself a difficult challenge. Some projects end up more as a resource-transfer operation than as a capacity-building venture. This was the fate of HACHO. Fortunately, the AOP has moved toward this capacity-building stage and has managed to strengthen local PVOs so they will be in a better position to continue with tree planting activities when external funding ceases. Even though much has been (and still is being) learned from the AOP, several problems still must be resolved. For instance, at the current rate of tree planting, it will take several generations until the tree product needs of Haiti can begin to be met and reforestation can occur. Therefore, other concurrent problem-solving attempts are needed to attack not only the deforestation, but also the urgent socio-economic problems in Haiti. This requires the active coordination and cooperation of the GOH with local PVOs and donor agencies.

Other issues to which answers are necessary are: Will the change in land-use pattern have an impact on the land available for sharecroppers or tenants? Maybe the landowner can increase his/her income if he/she plants trees on the land

rather than by lending it to a sharecropper. This would have detrimental impacts for the majority of small farmers (particularly young ones) who depend on the availability of such lands for their livelihoods. A similar question arises whether or not agroforestry leads to a reduction in labor requirements and therefore reduces labor employment opportunities? Finally, is agroforestry an effective strategy to reduce soil erosion problems, particularly on marginal sites?

A continuous learning process should accompany the process of organizing and motivating individual farmers or other social units able to mobilize and sustain agroforestry programs. This is essential to improve their structure and operation. This learning process approach is fundamental since there is no single "best" strategy available as an universal approach to all agroforestry development problems. Sociocultural perceptiveness and knowledge are therefore instrumental and indispensable for conceiving, designing and implementing any effective approach to agroforestry development. We also learned that fitting projects to people or seeing the people behind the trees should be the first commandment in designing and implementing future agroforestry projects.

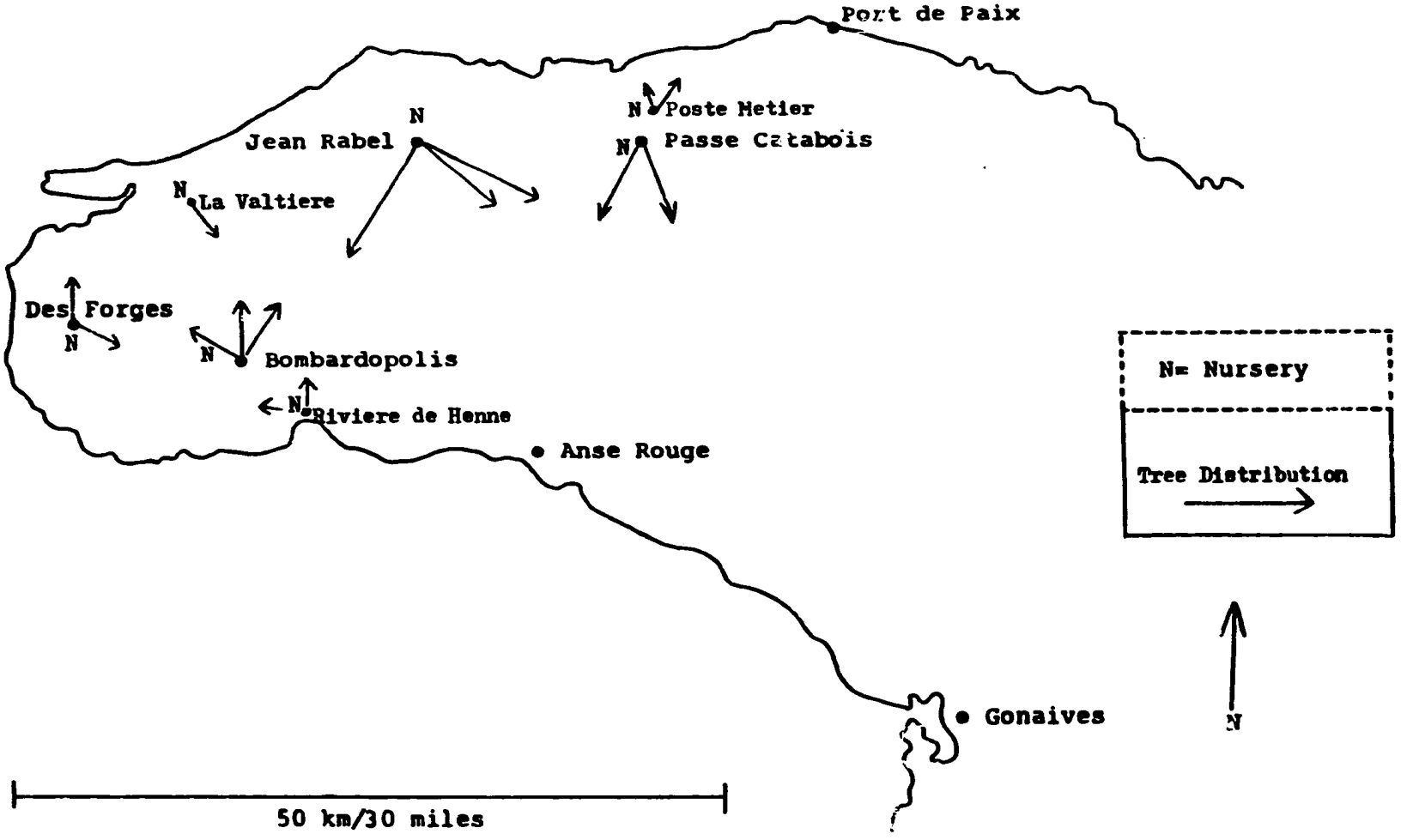
The achievements of the AOP may convince those pessimists who believe Haiti is a lost battle against the degrading resource base and the peasants' deteriorating living conditions. If a coordinated effort among the GOH and all organizations involved with tree planting activities can occur, maybe there is a hope to save what Columbus once called the "most beautiful island in the world."

Hopefully, the lessons learned from the AOP and the new ideas generated in this study will contribute towards developing new agroforestry schemes which open the doors of a sustained development process where also the voiceless people feel at home.

APPENDIXES 1 - 11

APPENDIX I

CARE'S PROJECT AREA MAP



APPENDIX 2

CARE'S EXPECTED END-OF-PROJECT OUTPUT

1. 10 fully operational containerized seedling nurseries, managed and staffed by trained and experienced local residents, with a combined annual production capacity in excess of 3 million seedlings.

2. 36 self-sufficient community-level nurseries, operated as private micro-enterprises deriving their income from the production and sale of fruit and vegetable seedlings, and also productin significant numbers of hardwood seedlings for local distribution, utilizing locally available and manageable technologies; combined potential annual production capacity is expected to approach 360,000 seedlings.

3. 16 schoolyard nurseries attached to local primary and secondary schools throughout the Northwest, also operated on a self-sustaining basis.

4. The total seedlings produced over the 8-year period will exceed 17 million; in addition, 550 ha of land in the Northwest will be treated with living hedgerow and alley cropping technologies.

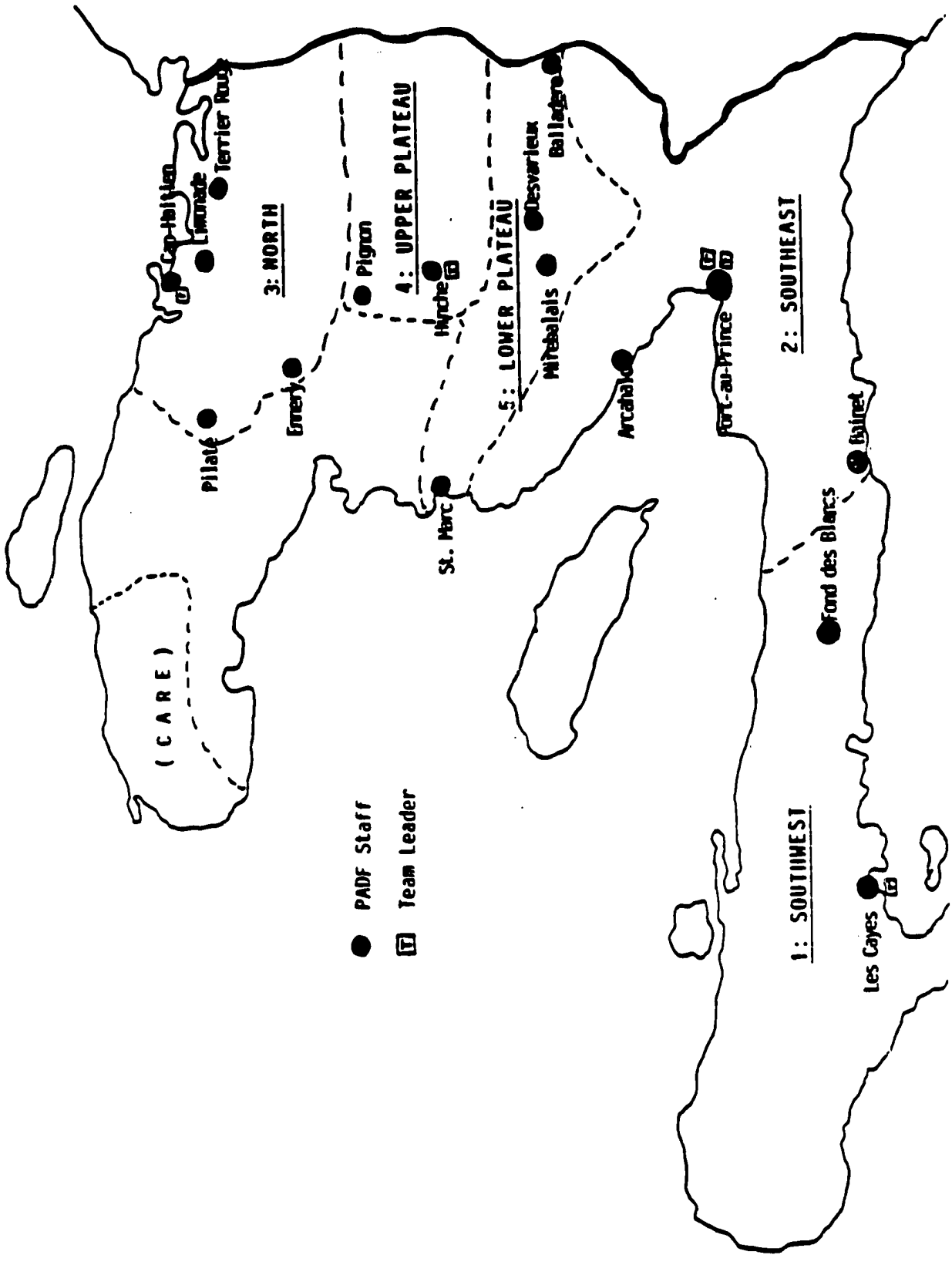
5. A trained and experienced local cadre of grass-roots extension personnel, including 150 monitors (agents) and 10 animators (supervisors).

6. A comprehensive extension training and nursery operations "package', codified in Creole-language manuals, curriculum and audio-visual materials, available for adaptation and application by other, similar programs.

7. Training inputs to more than 42,000 peasants participants, covering selected topics in tree-planting and agroforestry techniques.

APPENDIX 3

PADF'S PROJECT AREA MAP



APPENDIX 4

PADF'S AND CARE'S BUDGET

SUMMARY FINANCIAL PLAN - PADF COMPONENT (8).

Budget Category	Original Budget	Expenses Thru 9/84	Projected Expenditures FY 85	FY 86	FY 87	Total Expenses
I.Resource Center						
Personnel	1105000	741000	470000	407000	102000	1720000
Material Support	368000	230000	146000	126000	32000	534000
Training,Documentation	175000	34000	17000	15000	5000	71000
Home Direct	25000	13000	16000	14000	4000	47000
Overhead	265000	357000	227000	197000	49000	830000
II. PVO Subprojects	1580000	1175000	746000	646000	161000	2728000
III. Contingencies	390000	0	0	0	0	0
Totals	3900000	2550000	1622000	1405000	353000	5930000

Note: The non-AID contribution specified in the original PADF grant agreement totalled $1470000, and was comprised of personnel,training and material support from PVO organizations, home office support from PADF headquarters. Over the extended life-of-project, an additional $812000 is expected in PVO-contributed support.

SUMMARY FINANCIAL PLAN - CARE COMPONENT (8).

Budget Category	Original Budget	Expenses Thru 9/84 (est.)	Projected Expenses FY 85	FY86	FY 87	Total Expenses
Equipment Materials	593000	330000	120000	120000	30000	600000
Personnel Operations	1333795	761000	278400	278400	69600	1387400
Training Costs	42000	26000	9600	9600	2400	47600
Contingency	198000	84000	28800	28800	7200	148800
Overhead	162325	119000	43200	43200	10800	216200
Totals	2330000	1320000	480000	480000	120000	2400000

Note: The original non-AID contribution to the above CARE grant component included $100000 in CARE-generated funds, and $710000 in other inputs managed but not contributed by CARE. In addition, Title I amounting to $189600 and project support amounting to $135000 was to be contributed by the Organization for the Development of the Northwest, a parastatal organization.

APPENDIX 5

CARE'S TRAINING SCHEME

The International Foresters develop the training packages and train senior-level staff in training methodologies. In order to keep their information current, they are sent to regional and international technical workshops.

Haitian Agronomists: Newly-hired staff members are given an extensive reading list compiled by the International Foresters covering not only technical but also socio-economic topics. Throughout the initial two-month training period, they are expected to read the material and spend at least six weeks at their Project site to facilitate direct interaction between their co-workers and local farmers. During initial training and throughout their careers, agronomists are constantly reminded of the following: 1) field travel and contact with community-based extension staff and farmers is of utmost importance, 2) community participation and discussion should always be emphasized and 3) listening is the most important part of an agronomist's job.

Animators: Animators are high-level, community based extension staff. They are responsible for overseeing the work of up to eight Monitors. They receive four, two to three day training seminars per year (two per planting season) which are led by International Foresters and senior staff agronomists. Subjects covered include among others: training methods, plantation establishment, personnel management, soil conservation

methods, harvesting information, simple nursery techniques, etc. The content of Animator seminars varies, based upon the time of year and the stage of nursery preparation.

Monitors: Monitor seminars cover the same subjects as Animator seminars. Information, however, is further simplified, so as to be specifically applicable to local sites and cultural conditions. Monitors receive a one-day seminar per month led by Agronomists, and/or International Foresters. In addition, Monitors receive monthly one-day seminars held by the local Animator. Thus, minimally, Monitors receive 24 formal training seminars per year. The Project also organizes a four to five day inter-regional Monitor exchange which exposes them to methods used by the Project in other areas once a year. The Monitor is also trained in the use of questionnaires which serve as tools to enroll and monitor farmers. These questionnaires contain information on the farmer's species preference and provide information to the nurseries to aid the decision concerning the number and type of trees to grow. Each Monitor will visit nearly 100 farmers, first for enrollment, then to supervise weeding, pruning and protection activities and to ascertain survival rates. Shortly, the Monitors and Animators work closely with the farmers to motivate them to plant and tend trees as well as to adopt other soil conservation and agricultural techniques. Workshops are held with several farmers to teach improved techniques and to encourage farmers to provide advice among themselves. Both the Monitors and Animators are farmers themselves and live in the communities in which they work.

Nursery Managers and Assistant Managers: At the beginning of the Project, all of the Nursery Managers and Assistants attended a week-long practical workshop with the International Foresters and Agronomists at the ODH nurseries. The nursery manager received an additional three-month training course. Each year, they have to attend one three day seminar before each planting season which repeats basic nursery techniques, provides assistance in attacking common problems and provides new information in nursery management. The principal topics cover not only nursery management techniques, but also public relations, how to deal with Monitors, farmers and general public and general extension psychology. In addition, their nursery activities are supervised on a weekly basis by the Regional and International Forester.

Participating Farmers: Each Monitor is assigned the responsibility of identifying farmers who will attend in his/her area of work. Farmers are visited individually by the local Monitor and given information about upcoming animation seminars. In addition, the Monitor explains his/her work, why the Project is in this particular area and how it will benefit the farmer to attend the seminar.

Each group of 35-40 farmers benefits from four seminars before and after a planting season, which means 16 per year. These animation meetings intend to motivate the farmers by explaining the benefits accruing to them and the technical aspects involved in tree planting. Of the eight farmer group meetings held per season, five are run and led by the Monitor

alone, two are run by Animators, and one is run by the local International Forester/Agronomist team. In addition to Project-sponsored meetings, there are frequently community meetings sponsered by a Community Council to which the Project sends representatives when possible.

Field extension staff are encouraged to check farmers' concurrence with outplanting, care and management techniques. If a farmer refuses to follow the recommended procedure, senior staff visit these sites and encourage these farmers to try the recommendations on at least a few of their trees. It then becomes possible for them to compare results after a period of six months to a year. The Project has withdrawn from at least one community due to non-application of recommended planting and maintenance techniques. In addition, Monitors with consistent records of farmer non-compliance are dismissed from the payroll.

Decentralized Nurseries: Training for decentralized nurseries is a new component added in AOP II. These nurseries use only materials that are manufactured in Haiti, and methods are taught with the objective of insuring self-sufficient local nursery operations within a period of two-to-three years. Each nursery has three workers who receive training. Four seminars lasting one to two days are led by International Foresters and/or Agronomists.

APPENDIX 6

PADF'S ANIMATOR SEMINAR CURRICULUM

Day 1	Arrive at training site. Filmstrips: We Need Trees; Trees, Land, and People; Leucaena Multi-purpose Tropical Tree; Community Reforestation.* Discussion.
Day 2	Introduction to Proje Pyebwa and its principles and conditions. Visit to a Rootrainer nursery. Visit to an arboretum or tree plantation. Discussion of tree species, site preferences and uses. Lunch Tree planting technique with demonstration. Tree planting systems. Visit to tree plantations including Leucaena.
Day 3	Agroforestry defined, agroforestry systems. Leucaena as an agroforestry species. Motivation/Extension techniques. Lunch Animator Job Description. Use of Registration Form and Information Sheet.
Other topics:	Soil conservation, construction and use of the A-frame level, Leucaena living terraces, basic ecology, more on techniques and agroforestry systems.

* These filmstrips are available from World Neighbors. Proje Pyebwa has produced a Creole translation of the World Neighbors texts.

EDITOR'S NOTE: Since 1985 Proje Pyebwa has also produced six filmstrip series for use in the project. The Proje Pyebwa filmstrips cover the animator role; introduction to a number of tree species used in the project; tree planting, maintenance, pruning and thinning; management of Rootrainer nurseries, and species development in Rootrainer nurseries.

APPENDIX 7

PADF'S PLANTER REGISTRATION FORM

EDITOR'S NOTE: This is an English translation of the Creole language "Fey Enskripsyon" used by Proje Pyebwa, Pan American Development Foundation, Haiti Agroforestry Outreach Project, in 1985 and 1986:

Organization_____Extension Agent_____
Planter_____Plot Location_____Date_____

EXTENSION AGENT ("Animator"): First, ask the planter if he/she has land available to plant trees. If the planter has such land, ask if he/she owns the land. Secondly, ask the planter if he/she agrees to accompany the agent on each follow-up visit to the planting site. Enroll planters who are motivated and responsible. If the planter wishes to enroll, ask him/her to show you the site proposed for trees. Discuss the principle of planting trees on garden land as a cash crop. Go through the points mentioned below and leave an information sheet for the planter to study at home.

1. Trees are suitable for cash cropping.
2. Farmers who plant trees have the right to harvest them when and how they wish
3. Why is it better to plant trees together with other cash crops in the same garden?
   a) When the garden is weeded, the trees get weeded too.
   b) Since animals are kept out of the garden, the trees are protected from grazing.
   c) Trees in the garden are protected from fire damage.
   d) Trees can be readily inter-cropped with other garden crops.
   e) The trees provide useful services in addition to wood products.
4. What services do trees provide?
   a) Plant trees to harvest wood.
   b) Trees protect the land; the roots hold soil.
   c) Trees make mulch; the leaves enrich the soil.
   d) Tree roots help water to penetrate the soil.
   e) Trees serve as a windbreak; they slow down evaporation.
   f) Trees help retain moisture.
5. There are several ways to plant trees.
   a) closely spaced woodlot
   b) Along the garden perimeter c) rows
   d) terrace structures
6. What kinds of trees does the project have available? What purposes do they serve? Where do they grow best?
7. How should trees be planted?
   a) Plant as soon as possible to avoid loss.
   b) Plant trees at 3 meter intervals.
   c) Dig a small catchment basin to hold humidity.
   d) Plant only one tree in the middle of each catchment basin.
   e) Plant the trees straight up.
   f) Plant the trees at soil level (roots well buried).
   g) After planting, pat down the surrounding soil.
   h) Place a mulch around each tree to hold moisture.
   i) Place a stake or 3 rocks by each tree to mark its location.
   j) If water is available, water each tree after planting.

18 A

DELIVERY DATE_____ EXTENSION AGENT: Tree planters are expected to come and pick up their trees. If the planter is sick, he/she should send someone else.

	Species	Quantity
1.	_____	_____
2.	_____	_____
3.	_____	_____
4.	_____	_____

First Control Visit Date_____

EXTENSION AGENT: Have the farmer go with you to visit the planting site. If the farmer is not present, the work cannot be done! Count all of the trees. For each species count how many there are in the plot. Do this precisely, and do the work yourself.

	Species	Quantity	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
	TOTAL	_____	

EXTENSION AGENT: How are the trees planted? Along the boundary?_____-rows?_____ throughout?_____. What is the distance between trees? widely spaced?_____closely spaced?_____too close?_____. While you are talking with the planter in the garden, ask him/her some questions about the tree plantation. If the planter answers "no" to any of the questions below, explain how to take care of the trees correctly. Remember to use the information sheet.

1. Are the trees well marked, with stakes or rocks? Yes_____No_____
2. Are the trees weeded properly? Yes_____No_____
3. Do the trees have a catchment basin around them? Yes_____No_____
4. Are the catchment basins mulched to hold moisture? Yes_____No_____

Second Control Visit Date_____

EXTENSION AGENT: Count all the trees in the plot.

	Species	Quantity	
1.	_____	_____	_____
2.	_____	_____	_____
3.	_____	_____	_____
4.	_____	_____	_____
	TOTAL	_____	

EXTENSION AGENT: Use the information sheet as an outline for teaching about trees. Then ask the planter the following questions about the condition of the trees planted:

1. Of the trees you planted which species are in the best condition?_____
2. Are the trees weeded? Yes_____No_____
3. Do the trees have catchment basins? Are they mulched? Do they need re-doing? Yes_____No_____
4. Is there grazing damage? Yes_____No_____
5. Is there fire damage? Yes_____No_____
6. Do some of the trees need pruninng? Yes_____No_____

EXTENSION AGENT: If trees need pruning, use the information sheet to discuss proper pruning techniques.

APPENDIX 8

PADF'S INFORMATION SHEET

EDITOR'S NOTE: This is an English translation of the "Fey Ranseyman" used by Proje Pyebwa in 1985. At the end of 1985 this information sheet was revised and combined with pen and ink drawings in a 44 page tree planter's manual entitled Liv Plante Pyebwa (Tree Planter's Handbook). In 1986 an animator's field guide was produced in the form of a 132 page reference book including a series of hand held flip charts. This book incorporates the text and drawings of the Liv Plante Pyebwa plus additional commentary for animators to use in presenting the planter's handbook. This field guide is entitled the Gid Animate Pyebwa (Tree Animator's Guidebook). The information present in the following text has been incorporated and amplified in the new training materials:

Tree Project Information Sheet

This information sheet is a guide which can help you take proper care of a tree plantation. Tree care is the same as childcare. If adults do not take care of children, they become ill, grow badly or die. Natural life forces cause tree seeds to germinate. It is then our responsibility to plant the seedlings and take care of the young trees so they grow well and mature.

The points listed below are the same points which appear on the registration form for each tree planter:

1. Trees are suitable for cash cropping. Farmers already know that trees are very useful. Farmers are used to harvesting trees for planks, house construction and wood charcoal. There are people who criticize farmers for cutting down trees. The Tree Project does not agree. Cutting trees is not bad in and of itself. What is bad is cutting trees without planting trees too! The Project wishes to help farmers grow trees on their own land so they can cut down trees and then replant. This is no different from what farmers do with other cash crops. They harvest and then plant again.

2. Farmers who plant trees have the right to harvest the trees when and how they wish. The Tree Project will never prevent people from harvesting wood. We know that a farmer will not plant anything that he/she does not stand to harvest. When someone plants project trees, these trees belong to the farmer who planted them. As there are laws regarding tree cutting, the farmer must also comply with legal requirements. Apart from this, no other authorization is needed. The trees belong to the planter. The planter has the right to use them how and when he/she wishes.

3. Why is it good to plant trees together with other crops in the same garden? Trees go well with other crops customarily planted on garden land. This is an intercropping system, a marriage

between trees and food crops. Trees planted on garden land have a better chance to survive than trees planted elsewhere. Why is this? Because farmers always take special care of garden crops. When the garden is weeded, the trees are weeded too. Where trees are planted together with other crops, the trees are weeded along with the other crops. In active gardens, farmers do not burn the field nor graze animals. If the garden is fenced, both the trees and the other crops are protected. Thus, where corn is planted together with trees, young seedlings have a better chance to survive. Planting trees in the garden has certain other advantages as well. If the garden protects the trees, the trees can also protect the garden. There is a proverb which says, hands coming and going make friendship last. Its the same with trees in the garden. The garden protects trees, and in return, provide services to the garden.

4. What kinds of services can trees provide? We have already explained how trees are a cash crop. If a farmer plants 250 trees, he/she can begin the harvest of trees in 3 or 4 years for polewood, housing construction and charcoal. If the planter waits several more years, the trees can be cut for planks. The woodlot serves as a kind of bank account.

--If the trees are planted along the garden perimeter, they can serve as a living fence. When the farmer works in the garden, he/she can cut a few branches to take home for fuelwood.

--Trees protect the soil so that erosion does not carry off valuable topsoil. Where heavy rains cause runoff, tree leaves break up the rain so that it falls more gently. If rainfall loosens the soil, tree roots prevent the soil from washing away.

--Where the wind blows, the wind speeds evaporation. If there are trees, the wind's force is diminished. Where the wind damages other crops in the garden, trees can serve as a wind break.

--Trees help retain moisture in the soil. During the dry season, tree leaves hold moisture. The leaf litter becomes a mulch and enriches the soil. When the sun beats down on the garden, trees provide shade and protect other crops so they do not burn up. Where there are trees, their roots help rain water penetrate the soil so other crops can benefit from the moisture.

--Where the soil is depleted of nutrients, trees enrich it. Roots dig deep into the soil. The roots seek water and nutrients from deep down in the soil and pump them up into the leaves. When the leaves fall, they make mulch and provide needed nutrients to depleted soil. Among the trees in the Tree Project, there are species which fixate nitrogen, a fertilizer which enriches depleted soil. This fertilizer benefits other associated crops.

5. There are several ways to plant trees: You may choose the method that is best suited to your land. All of these methods permit you to intercrop trees and other crops. These methods also allow you to harvest trees as a cash crop.

--Closely spaced woodlot: You may wish to plant trees so as to cover over the garden land. If you plant a woodlot, 1/8 carreau can take 400 trees planted at 3 meter intervals. Even if you plant a woodlot which completely covers the land, you can still cultivate other crops for 3 seasons after you have planted the trees. Be sure to weed the trees to permit maximum growth. With this method it is best to choose land you would otherwise keep in fallow. This permits you to harvest trees and enriches the soil such that you can plant other crops at a later time. Once the trees are harvested, you can then plant other crops on garden land renewed by fallow.

--Along the garden perimeter: If you plant along the garden perimeter, 1/4 carreau can take 120 trees planted at 3 meter intervals. One carreau of land can take 250 trees planted along the perimeter. This method does not allow planting a large number of trees, but it leaves the garden free for other crops.

--Rows: If you plant in rows, leave a distance of 10 to 20 meters between each row. Plant at 3 meter intervals within the row. Plant along the contour such that it serves to control erosion. Ask the extension agent how to use the A-frame in order to trace out the contour on sloped land. Trees planted in rows have the advantage of leaving plenty of space for other crops. The rows can also serve as a windbreak. It is a very good method for maximizing the benefits of intercropping.

--Terrace structures: This method is very useful for soil conservation. It permits you to conserve soil on garden land. It protects sloped land. It helps to control soil erosion in ravines. This method establishes a living barrier to hold the land so that water does not carry it away. The trees should be closely spaced at one meter intervals. Plant along the contour, using the A-frame, as in the row method above. Planting trees in this manner fits in very well with the use of brush terraces, or with dry wall bench terraces, or contour canals. Where there are dry walls or contour canals, plant the trees close to the terraces on the bottom side. Using trees in a living terrace system serves to create an excellent terrace structure over time as dirt silts in. Ask the extension agent how to use the A-frame and how to plant a living terrace properly. This requires a special technique, both in planting and in terrace maintenance. It also requires careful pruning.

6. What kinds of trees does the project have available? Among the native trees there are Catalpa longissima, Mahogany, Columbrina arborescens, Cedar and Pithecellobium saman. Imported species include the following:

Species	What type soil?	How can the wood be used?
Neem	It does well almost anywhere, does not like poorly drained or saline soils. Do not plant at altitudes above 500 meters.	It makes polewood, charcoal and planks. It serves as a windbreak, provides shade, conserves soil and is resistant to insects. It re-coppices.
Cassia siamea	It likes deep well drained soils. It grows best below 500 meters.	Planks, housing beams, charcoal, furniture, windbreaks, soil conservation, re-coppices.
Eucalyptus	Grows at any altitude. Does not like hard limestone soil. Likes a deep, well drained soil.	Polewood, charcoal, beams, windbreaks, soil conservation, re-coppices.
Acacia auriculaformis	Likes all types of soils, even depleted soil. It grows best below 500 meters.	Charcoal, beams, shade, soil conservation, nitrogen fixing.
Casuarina	Good to plant at any altitude. Does not like clay or swampy soils. Can tolerate saline and hard limestone soils.	Polewood, beams, charcoal, soil conservation, windbreaks nitrogen fixing.
Leucaena leucocephala	Does not grow well above 500 meters. Likes all types of well-drained soils. Does not tolerate clay and acidic soils.	Beams, charcoal, planks, soil conservation, nitrogen fixing, re-coppices. The leaves are good for animal forage.
Grevillea	Good to plant above 500 meters. Likes deep soils. Does not like swampy soils.	Polewood, beams, charcoal, shade. Bees like its blossoms.
Venezuelan Mahogany	Does not grow well above 600 meters. Likes good soils. Does not withstand drought. Grows more rapidly than the native Mahogany.	Makes good planks, polewood, furniture, shade, windbreaks, soil conservation.

7. How should trees be planted? The seedlings need to be planted quickly before they dry out or rot. In general trees need to be planted at least 3 meters apart. If they are too closely spaced, their growth is retarded. Where the tree is to be planted, dig a little catchment basin to conserve moisture. Each tree should be planted individually in the middle of a small catchment basin. Plant the trees straight up and down. Plant them at soil level with the roots well buried. After the seedling is planted, pat down the soil around the tree so it is not too loose. Mulch around the base of the tree. Mulching the catchment basin aids

moisture retention. Stake each tree to mark the position of each seedling. If stakes are not available, place 3 rocks by the trees as markers. Water the trees if there is water readily available.

TECHNIQUES FOR MANAGING TREES AFTER THEY BEGIN TO DEVELOP

8. What is the proper technique for weeding trees? Why weed trees? It is to help them develop faster like any other crop. To avoid damage mark each tree with a stake or 3 rocks. It will then be easier to see young seedlings so they are not cut down along with the weeds. The proper way to weed trees is to weed in a circle around each tree. This circle should have a diameter of 1 meter. Inside the circle you should weed thoroughly. Each time you weed the trees, re-do the catchment basin in order to assure moisture retention. When weeds are cut down, put these clippings in the catchment basin as a mulch.

9. What technique is used to assure that trees grow straight through proper pruning? Why prune trees? It is to assure that they grow straight and tall. Do not prune beyond the lower third of the tree. When cutting branches, cut up from underneath the branch. Branches should not be cut from above. This way you avoid tearing the bark. Be sure to cut the branches with a well sharpened machet. Leaves that fall during pruning can be used as mulch.

APPENDIX 9

SUMMARY OF OUTPLANTING BY SEASON 1982 - 1986

SEASON	PVOS	ANIMATORS	FARMERS	TREES	ANNUAL TREES
#1- S 1982	23	40	1,191	508,933	
#2- F 1982	47	75	2,260	1,401,865	1,910,798
#3- S 1983	54	191	4,108	1,473,216	
#4- F 1983	58	237	5,509	1,931,606	3,404,822
#5- S 1984	62	310	6,527	2,288,840	
#6- F 1984	72	328	9,023	2,359,618	4,648,458
#7- S 1985	84	553	14,690	2,534,471	
#8- F 1985	82	581	15,168	2,833,167	5,367,638
#9- S 1986 *	75	613	16,078	2,533,733	
#10- F 1986 *	69	591	13,441	2,012,906	4,546,639
TOTAL					19,878,355

* Decrease in 1986 statistics were due to the uncertainty of the extension of the project beyond December 1986.

APPENDIX 10

SOCIAL VARIABLES NECESSARY TO CONSIDER IN THE DESIGN OF AGROFORESTRY PROJECTS

These variables are restricted to the design of projects for individual land use. With regard to land held in common, other inquiries are necessary to determine who has the right to use it, how it is used, who control it, etc.

Population

* **Settlement Patterns:** dispersed or nucleated? This affects design of extension system, location of nurseries, estimates of personnel required to implement project, choice of technology (i.e. polyethene bags vs. rootrainers)
* **Population Growth Rates:** required to predict future demand for land for food crops, the need for fuelwood, and the constraints on the availability of land for the project
* **Population Homogeneity:** segmentation affects the ability of beneficiary to work in common. Different groups may need special extension approaches.

Land

* **Landholding and Land Use Patterns:** who uses and owns the land? statutory vs. traditional title; landuse arrangements (i.e. sharecropper, tenant, owner,etc.); could tree planting cause a change in tenurial system or current tree cultivation patterns; ownership of trees vs. land; land available for the project?

* **Species Preference:** why are certain species preferred? Purpose of trees? Willingness to plant trees? Attitudes towards trees? Pros and cons of native vs. exotic species? Food preparation practices?

Labor

* **Division of Labor:** which components of project should be allocated to men, which to women? Existence of labor-sharing arrangements? Can they be applied to tree crop operations?
* **Labor Availability:** time available for tree crop operations? Labor calender/cycle?
* **Voluntary vs. Paid Labor:** existence of voluntary common action? Distribution of benefits in communal projects?

Social Organization

* **Leadership:** what is pattern of hierarchy and local power pattern? Who participates in decision-making process?
* **Existence of Different Groups and Institutions:** Inter-relationships between them? What organizations exist capable to implement the project?
* **Communication System:** How are ideas, messages and innovations introduced and communicated?

Demand and Supply of Fuelwood, Fodder and Other Tree Products

Accessibility of these resources? Use by different socio-economic groups? Time involved in collection? Alternative

energy systems? Ranking preference of different types of fuel? How many trees does a family need to attain fuel selfsufficiency?

Local Knowledge about Trees

What information about tree species and their uses do exist? What agroforestry systems already exist?

Past Development Projects

What were factors that caused or were associated with their success or failure?

This information should be made available as early in the project cycle as possible so that the data can be assessed and form an input in project design. This information about social variables has the greatest utility at the project preparation stage since it becomes increasingly difficult to alter the shape of the project and its components as the projec cycle proceeds.

APPENDIX 11

NATIVE AND EXOTIC TREE SPECIES DISTRIBUTED IN 1986

Native	Exotic
Albizzia lebbeck (Tcha-tcha)	Acacia auriculiformis (Akasya ori)
Artocarpus altilis (Labapen)	Azadirachta indica (Nim)
Carica papaya (Papay)	Cassia siamea (Kasya)
Catalpa longissima (Chenn)	Casuarina equisetifolia (Bwa pen ostrali)
Cedrela odorata (Sed)	Casuarina glauca (Pich pen)
Citrus aurantifolia (Sitwon)	Cupressus lusitanica ---
Citrus grandis (Chadek)	Eucalyptus camaldulensis (Kaliptis)
Citrus sinensis (Zoranj dou)	Grevillea robusta (Grevilya)
Columbrina arborescens (Bwa kapab)	Leucaena diversifolia ---
Cynamomum (Kanel)	Leucaena leucocephala (Lisena)
Gliricida sepium (Piyong)	Swietenia macrophylla (Kajou gran fey)
--- (Grenadin)	Tectona grandis (Tek)
Guaicum officinale (Gayak)	
Haematoxylon campechianum (Kampech)	
Hibiscus elatus (Maho ble)	
Jacaranda mimosifolia (Flambwayan)	
——— (Katenga)	
Lysilona latisilique (Tavernon)	(Native, continued)
Mangifera (Mango koydok)	Psidium guayava (Gwayav)
Moringa oleifera (Benzoliv)	Sesbania grandiflora (Pwa valye)
Pinus occidentalis (Bwa pen)	Simaruba glauca (Fwenn)
Pithecellobium saman (Saman)	Spondias purpurea (Siwel)
Pityllostylon brasiliense (Bwa blan)	Theobroma cacao (Kakao)

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